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# MONTANA

Fish and Game Commission

## QUARTERLY REPORT



JANUARY - MARCH, 1951

*Wildlife Restoration Division*

PITTMAN-ROBERTSON FEDERAL AID PROJECT

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Helena, Montana  
April 15, 1951


Regional Director  
Fish and Wildlife Service  
Swan Island  
Portland 18, Oregon

Dear Sir:

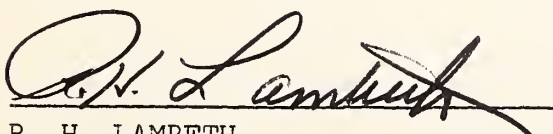
We are herewith submitting a Quarterly Progress Report in connection with the projects carried out through the use of Federal Aid in Wildlife Restoration funds.

The coverage is for the period January, February, and March, 1950.

Submitted by:

  
Robert F. Cooney, Director  
Wildlife Restoration Division

Approved by:

  
R. H. LAMBETH  
State Fish and Game Warden





QUARTERLY PROGRESS REPORT  
For The  
WILDLIFE RESTORATION DIVISION

STATE OF MONTANA

FISH AND GAME COMMISSION

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Assistant Director, Wildlife Restoration Division	- W. K. Thompson

Volume 11 Number 1

January, February and March, 1951



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W. K. Thompson . . . . . Assistant Director  
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Wm. R. Bergeson. . . . . Upland Game Bird Biologist  
Wynn G. Freeman. . . . . Waterfowl Biologist

Upland Game Project Personnel

Robert J. Greene . . . . . Assistant Game Bird Biologist  
Fred L. Hartkorn . . . . . Field Biologist

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STATE Montana  
PROJECT 36-R  
DATE April 15, 1951

ABSTRACT

Lincoln County Deer Management Study

During the hunting season of the fall of 1950 checking stations were operated to obtain needed research data. The area under study was open to the hunting of all deer. Following are some of the important findings.

1. Hunter success was .3 per cent higher this season than in 1949.
2. Legal bucks made up 22.4 per cent of the total kill.
3. White-tailed deer made up 82.4 per cent of the harvest.
4. Age composition ranged from 6 months to 10 years and over.
5. Sixty per cent of the deer were  $4\frac{1}{2}$  years old or older if fawns are excluded.
6. There were more  $4\frac{1}{2}$ ,  $5\frac{1}{2}$  or  $6\frac{1}{2}$ -year old deer killed than in the  $2\frac{1}{2}$  or  $3\frac{1}{2}$  year class.
7. Six mature females had produced 10 embryos in the previous year.
8. Hunting pressure was greater in the first week of the season, when  $\frac{1}{3}$  of the total kill was taken.





STATE Montana  
PROJECT 36-R  
DATE April 15, 1950

QUARTERLY PROGRESS REPORT

FOR

SURVEYS AND INVESTIGATIONS

As Required By

FEDERAL AID IN WILDLIFE RESTORATION ACT

1. Title of Project - Lincoln County Deer Study
2. Project Personnel- Jack E. Schmautz, Unit Biologist, Wildlife Restoration Division

Ade Zajanc, Asst. Unit Biologist, Wildlife Restoration Division

3. Report of Progress:

The 1950 Big Game Season in Fisher-Wolf Creek Area

Buck hunting in Lincoln County extended from October 15 to November 15, inclusive, a total of 32 days. A special antlerless deer season was enacted in the lower Fisher-Wolf Creek area, and ran concurrently with the regular season. The 1950 season was the second consecutive antlerless season held in this area.

PURPOSE:

Past surveys and studies within the Fisher River area have shown that the winter range has been severely over-utilized by deer. As a result of these studies, the Montana Fish and Game Commission authorized the removal of 500 antlerless deer, both white-tailed and mule deer, from this area. These deer were to be removed by hunters during the regular buck season. However, if the antlerless kill appeared to run over the 500 mark, it was emphasized that the area could be closed within a three-day period. This was not necessary, however, because the hunting pressure was not great enough to exceed the proposed take.

This report summarizes the results of the special season and the regular buck season in the Fisher-Wolf Creek area.

## PROCEDURE:

### Checking Stations:

#### Location:

Three checking stations were strategically located in the Fisher River area to intercept all traveled roads going into the special hunting area.

#### Personnel:

The permanent men engaged to operate the checking stations were part-time Forest Service employees. A number of Wildlife students came up from the University at Missoula to help out with the Island Lake checking station. It is felt that the excellent cooperation received from the sportsmen this year was directly due to the courtesy of the checkers. The students were very helpful in that they could discuss and explain many of the questions asked by the sportsmen. Thus they were instrumental in creating a great deal more interest in our program, and were able to show the sportsmen how the slight delay to which the hunters were subjected at the checking station while the checkers gathered statistics would eventually aid the department in gaining facts to properly manage the deer herd in this area. The names of the personnel and stations they operated are listed in Table I.

Table I.

<u>Station</u>	<u>Checkers</u>	<u>Location</u>
Waylett	Meritt Waters Everett Noel	NW $\frac{1}{4}$ , NE $\frac{1}{4}$ Sec. 26, T 27N, R 30W
Island Lake	Lee Tom Bleson Wm. Baber (Dan Poole, John McDougal, D. H. Tyler, George Devan, R. L. Carter, Melvin Feinblum, Roger Hungerford, Dwight Stocketad, John Gaffney, STUDENTS)	SW $\frac{1}{4}$ , SW $\frac{1}{4}$ , Sec. 31, T 29N, R 36W
Brush Creek	Wm. Meany, Jr.	NW $\frac{1}{4}$ , NW $\frac{1}{4}$ , Sec. 34, T 31N, R 26W

#### Measurements:

All information regarding the hunters and their kills were reported on standard Fish and Game Department checking station cards. Data concerning the kills included species, sex, diameter of antler one inch above the burr, weight, length of hind foot, and lower jaws were collected for aging purposes. In addition, the reproductive organs were collected from females

whenever possible. Information dealing with the hunter included his name, address, license number, cost of trip and calibre of gun used.

#### Hunter Maps and Instructions:

A map showing the area boundaries, with a write-up, giving the reasons for the antlerless season and including pictures of the location of female reproductive organs in a deer as it appeared to a hunter when dressing the animal, were given to the hunter as he entered the area. These maps and instructions were well received by the hunters and proved to be an excellent public relation effort as well as a help in the collection of data, mainly the reproduction organs. However, this material was not received until after the first week of the season had expired, resulting in a loss of considerable valuable data.

#### Location of Kill:

As each hunting party checked out, they were asked to locate their kill on a map furnished each checking station.

#### Checking Card Analysis:

After the season ended, data from the checking station cards were classified and analyzed to obtain the information presented in this report.

#### Description of the Area:

The area opened to the hunting of antlerless deer included all of the lower Fisher River and its tributaries north of U. S. Highway No. 2, an area of approximately 232,000 acres. With the exception of a few scattered homesteads, title to the land is held by the Anaconda Copper Mining Company, the J. Neils Lumber Company, Northern Pacific Railroad, State of Montana and the Kootenai National Forest.

Vegetation cover varies with the site. Ponderosa pine dominates south slopes with Douglas fir and larch being dominant species on the north slopes. The lower flats and the benches with north exposures are covered with "doghair" stands of lodgepole pine, interspersed with thickets of Douglas fir. The overstory is generally Ponderosa pine and larch.

Browse conditions are good to excellent on summer range and poor to very poor on the winter range.

#### Weather Conditions:

As a whole, the season was unfavorable for hunting because of mild weather. The rainfall was far above average for that period. Out of the 32 days hunting season, there were 17 days of measurable rainfall and 3 days of trace. On November 1 there was a general snowfall of approximately 3 inches, which probably had no great effect on forcing the deer from their summer range.



### Results of the Hunting Season:

Two thousand nine hundred and forty-two hunters bagged 579 deer, 5 black bear and 7 bull elk, which represents a hunter success of 19.6 per cent.

Most of the deer killed were checked through the Island Lake checking station, followed by Waylett checking station, and Brush Creek checking station had the least number of deer checked. As can be seen in Table II, 324 or 57 per cent of the deer checked out came through the Island Lake checking station. There were 19.6 per cent of the hunters and 22 per cent of the total deer checked through this station during the first week of the season.

Table II. Deer killed in Fisher-Wolf Creek Area - 1950 hunting season.

Station	<u>White-Tailed</u>				<u>Mule Deer</u>				% of	No. Hunters	% of	
	Buck Does		Fawns		Buck Does		Fawns		Total		Hunter	
									Kill		Success	
Brush Creek	0	26	4	6	1	2	1	1	41	7.1	319	12.8
Waylett	30	75	29	27	21	24	6	2	214	35.9	1064	20.1
Island Lake	58	121	46	56	20	17	3	3	324	57.0	1559	26.3
Total	88	222	79	89	42	43	10	6	579	100	2942	19.6
% of Kill	15.2	38.3	13.6	15.3	7.2	7.6	1.7	1.0	100			

White-tailed deer formed the largest part (82.4 per cent) of the deer harvest in the area. (Table II.) Generally, the mule deer range higher and farther from the roads and are therefore less apt to be seen by the average hunter. It should be pointed out that legal bucks composed 22.4 per cent of the kill and if buck fawns were included, the bucks composed 37.7 per cent of the total kill.

### Age Composition:

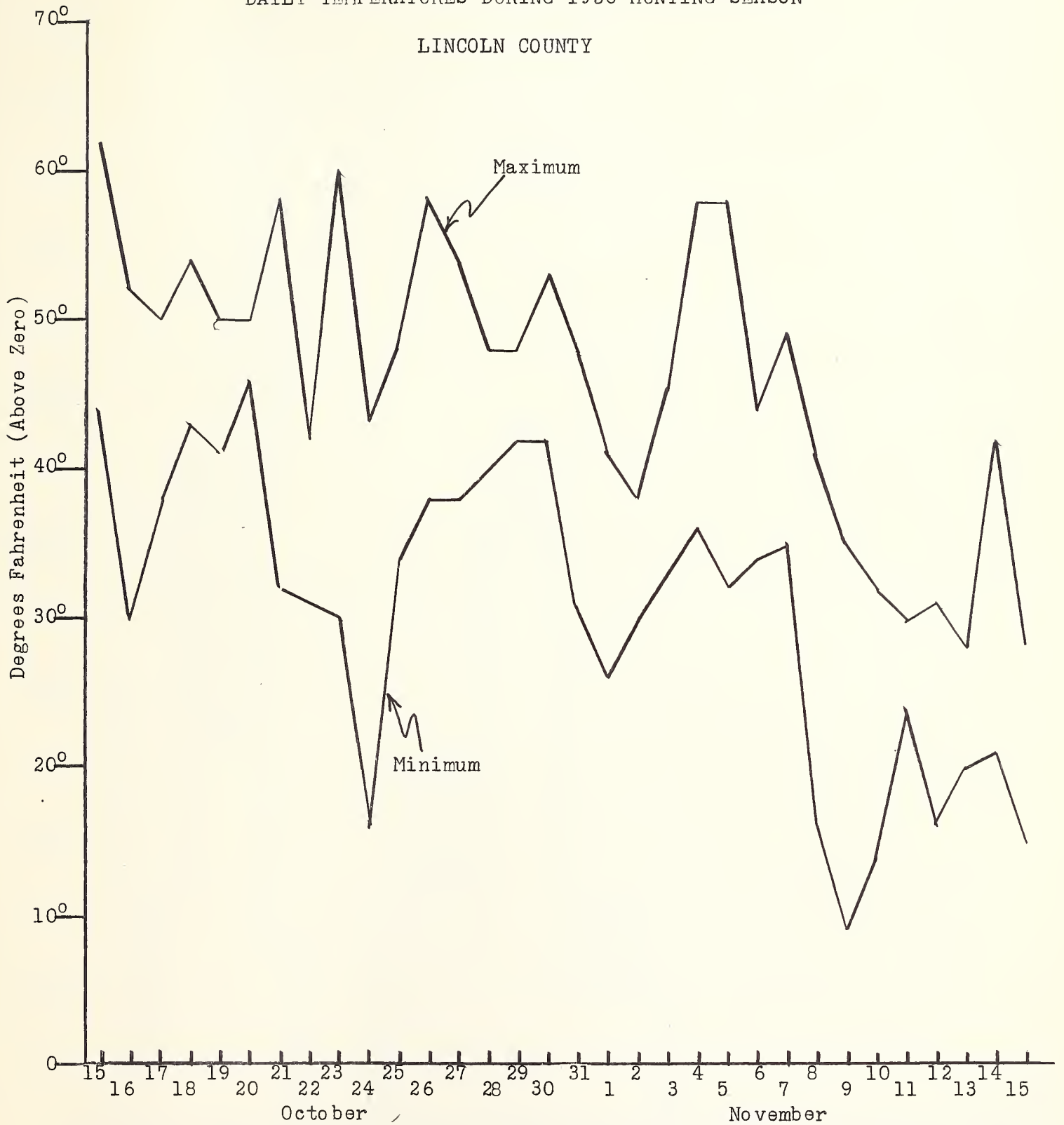
Jaws of 25 per cent of the deer killed were collected and later aged according to the Severinghouse method. It was found that the composition of the deer killed ranged from  $\frac{1}{2}$  year old animals (fawns) to 10+ years. (See Figure III.) One of the most important factors revealed in the age analysis was the number of older deer that are surviving. If the fawns are disregarded, we find that almost 60 per cent of the deer killed were  $4\frac{1}{2}$  years or older. The  $2\frac{1}{2}$  and  $3\frac{1}{2}$  year age groups are at a minority when compared to the  $4\frac{1}{2}$ ,  $5\frac{1}{2}$  or  $6\frac{1}{2}$  age classes. These facts seem to indicate that the mortality rate of the  $2\frac{1}{2}$  and  $3\frac{1}{2}$  age groups was greater than the other groups mentioned.

This survival of older deer appears to indicate that in the Wolf Creek-Fisher River herd, the annual increment is not being properly harvested. It is quite probable that starvation and predation may be the factors that are more apt to control the herd rather than the hunter harvest.

Figure I.

DAILY TEMPERATURES DURING 1950 HUNTING SEASON

LINCOLN COUNTY







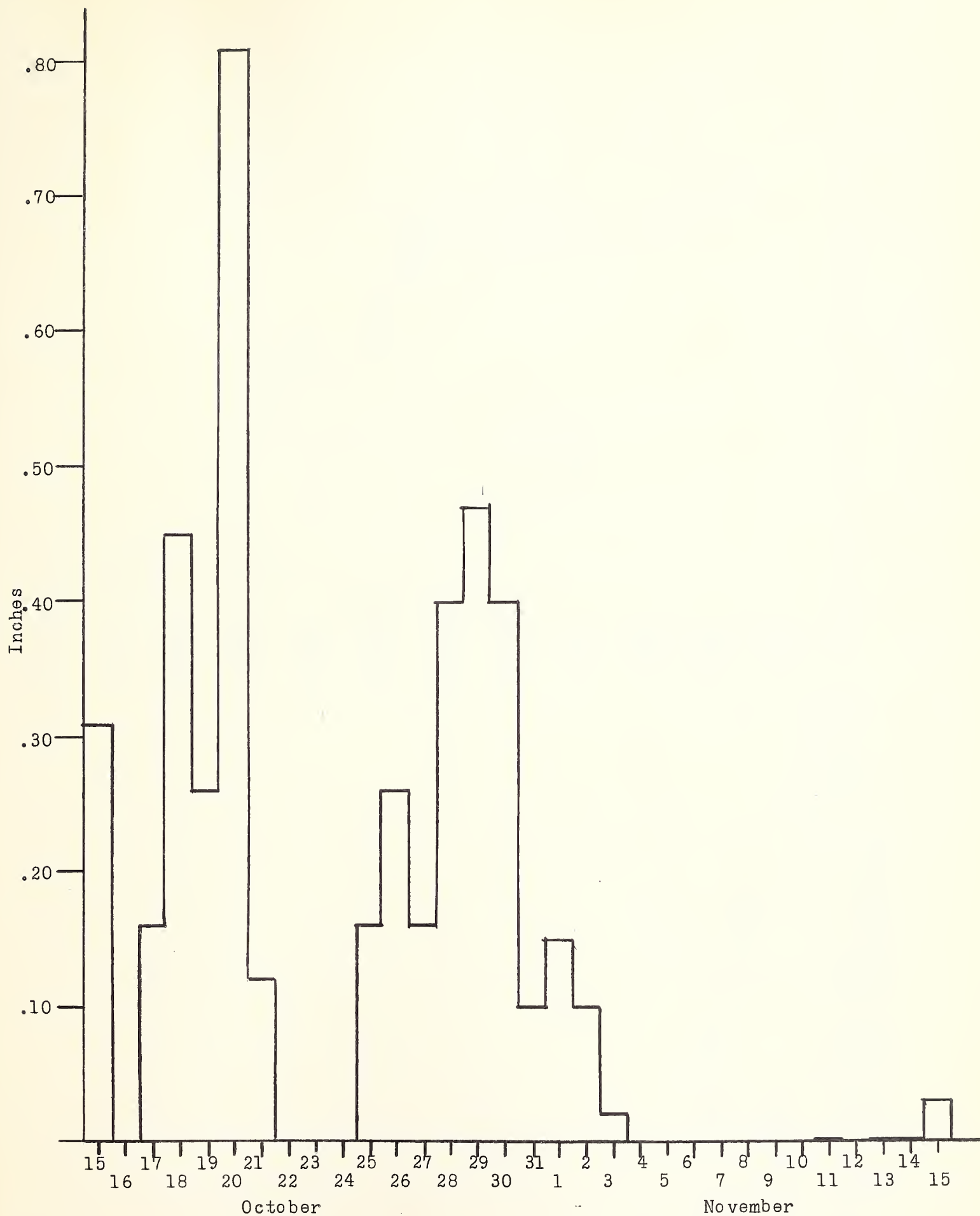
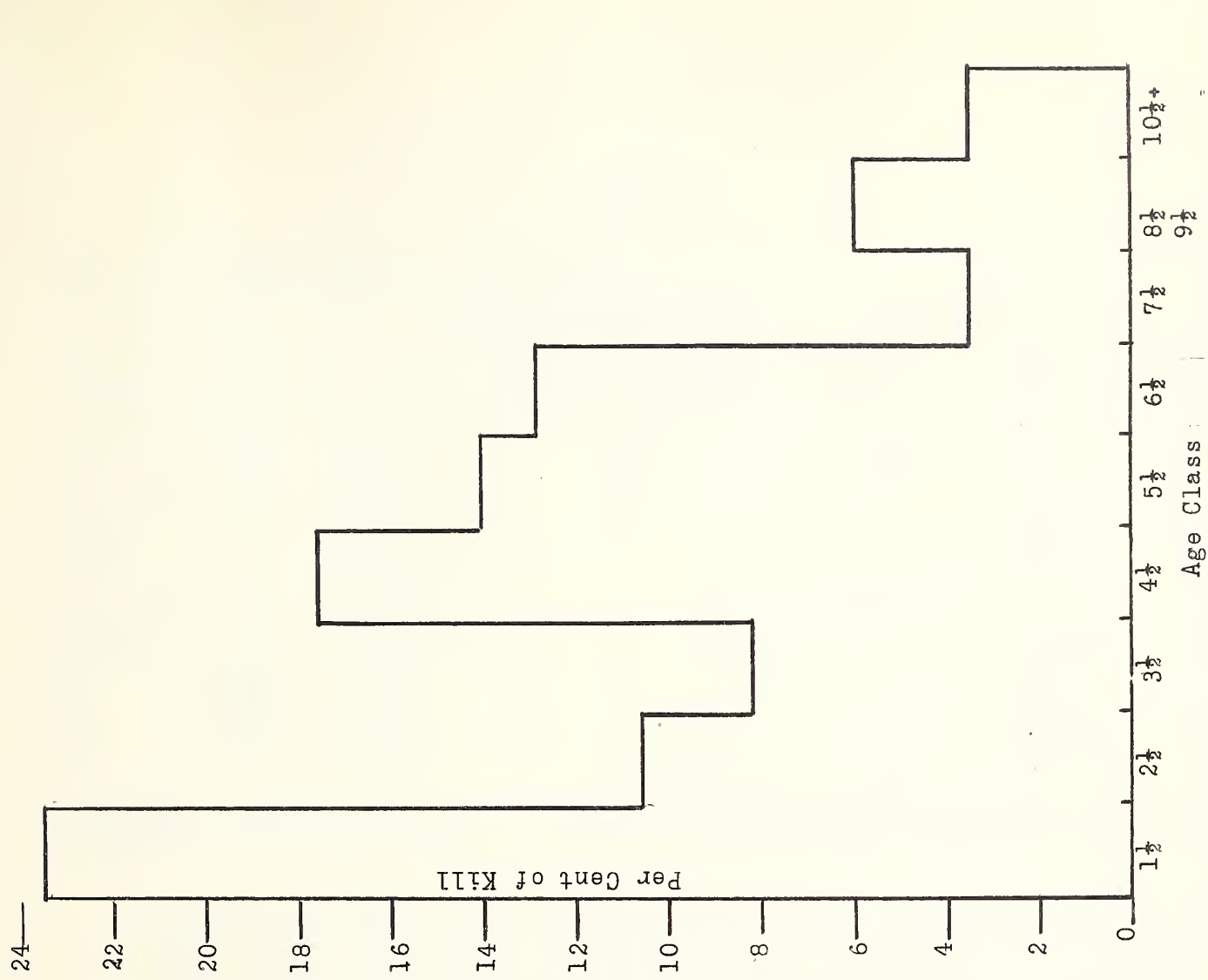
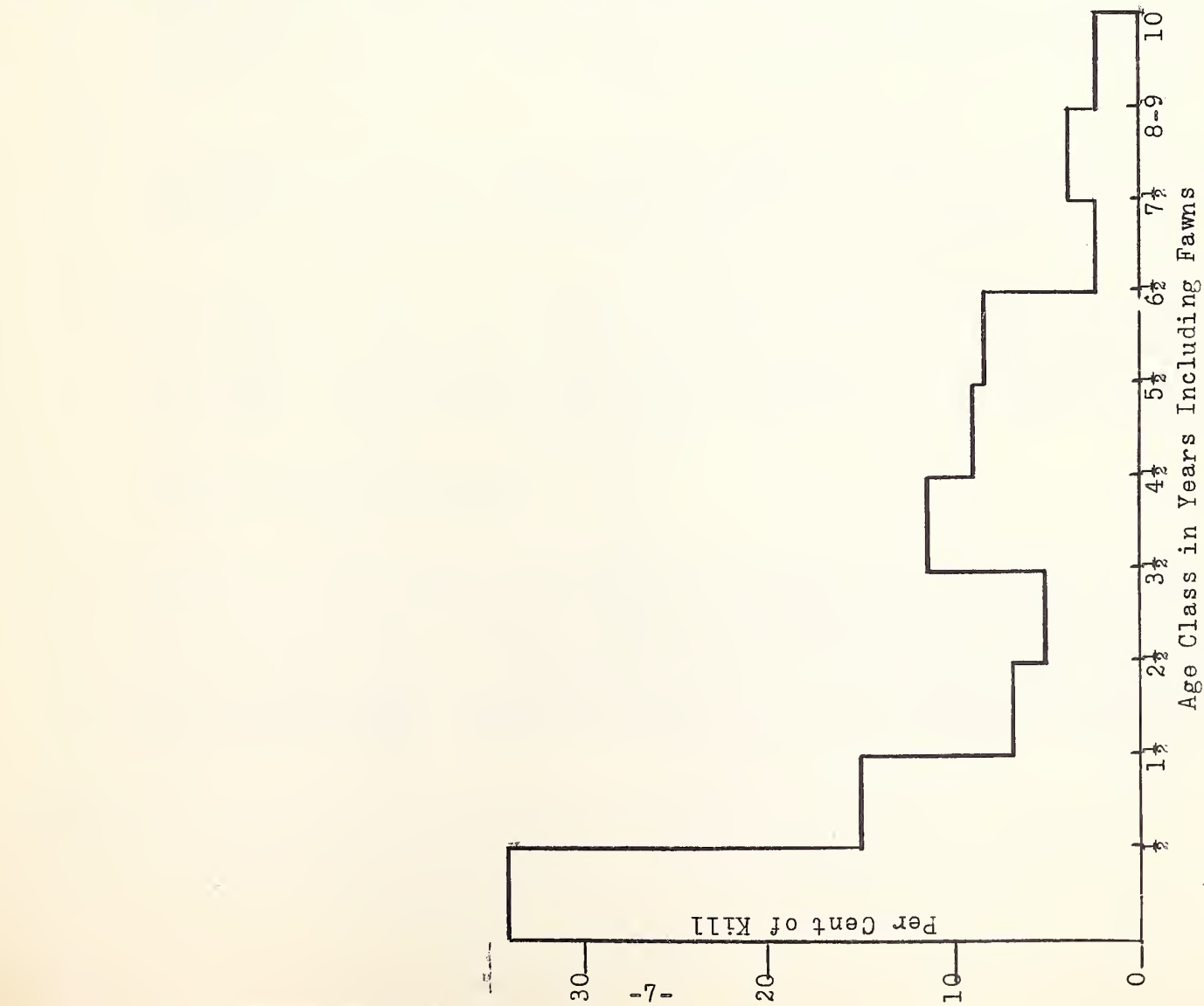


Figure II. DAILY PRECIPITATION DURING 1950 HUNTING SEASON, LINCOLN COUNTY.





Age Composition of Kill Older Than Fawns, Fisher River, 1950

Figure III. PER CENT OF KILL





Table III. Reproductive potential\*

Number	Age	Uterus	Corpora lutea Scars		Follicles		Ovulation Rate
			Left Ovary	Right Ovary	Left Ovary	Right Ovary	
P.V. 533	6½	Mature	1	0	1-5mm	1-5mm	1
P.V. 1X	5½	Mature	1	1	1-5mm	2-4mm	2
P.V. 193	-	Mature	0	2	0	1-5mm	2
W-740		Mature	1	0	0	1-4mm	1
W-386	5½	Mature	1	1	0	2-5mm	2
P.V. 623		Virgin	0	0	2-5, 6mm	0	0
Unknown		Mature	2	0	0	1-4½mm	2
P.V. 161	Fawn	Virgin	0	0	0	2-5mm	0
307	Fawn	Virgin	0	0	0	1-5mm	0
378	Fawn	Virgin	0	0	0	1-5½mm	0
169	1½	Virgin	0	Missing	1-5mm	Missing	0

\* Through cooperation with E. L. Cheatum, Montana State University Research Unit.

In the six mature uteri examined, there were ten eggs produced. However, this does not mean that there would have been ten fawns produced, since the fertilization rate in this area is not known. If we use the fertilization rate (85 per cent) found in the state of New York, it would show that the average embryo production of the ten mature does would be 1.4 per doe.

Although the fawns possessed fairly large follicles in a few instances, no evidence was found that they had actually ovulated. Further, the 1½ year old deer produced no corpora lutea scars. Continued collections and examinations may provide something more specific in regard to this.

Reproductive rate of the female along with range conditions and available forage would be a valuable tool to management. If these factors were known, the maximum productivity of a herd on a given range could be found. Then optimum numbers would be harvested in order to keep up the desired production of the deer herd.

#### Weights and Measurements:

Spread of measurements for bucks and does is shown on Table V. Inspection of this table shows that the overlap and spread is so large that no correlation between ages and measurements can be drawn. In all probability, part of the reason for the lack of correlation may be due to the small sample. Continued efforts in this phase should provide an adequate sample and may show some correlation between measurements, weights, and age.

Table IV. Comparison of hog dress weights to 1949 season.

	Largest	Smallest	Average	No. Weighed	% of Total	1949 Average	No. Weighed
White-tailed							
Buck	205	75	136	45	51.1	135.9	43
Does	175	70	103	88	39.6	102.5	77
Fawns-does	70	40	53	45	50.5	49	56
Fawns-buck	67	40	54	40	50.6		
Mule Deer							
Bucks	305	80	165	19	45.2	174	21
Does	200	85	132	21	49	103	10
Fawns-does	65	53	59	4	66	70	2
Fawns-buck	60	45	52	5	50		

Table V. Age, hog dress weight, hind leg measurement of white-tailed deer, 1950 season.

Age	Weight	Number Weighed	Hind Leg Length in Inches	Number Measured
$\frac{1}{2}$ Buck	40-- 64	45	13 $\frac{1}{2}$ - 17	29
$\frac{1}{2}$ Doe	40-- 70	40	13 $\frac{1}{2}$ - 19	35
1 $\frac{1}{2}$ Buck	75--125	7	16 - 19	5
1 $\frac{1}{2}$ Doe	80--113	8	16 $\frac{3}{8}$ - 18 $\frac{3}{4}$	6
2 $\frac{1}{2}$ Buck	125--140	5	18 - 19	4
2 $\frac{1}{2}$ Doe	100--105	2	17 $\frac{7}{8}$	1
3 $\frac{1}{2}$ Buck	173--180	2	18 $\frac{5}{8}$	1
3 $\frac{1}{2}$ Doe	95--100	3	17 - 18 $\frac{1}{2}$	3
4 $\frac{1}{2}$ Buck	140--173	2	19 $\frac{1}{2}$	1
4 $\frac{1}{2}$ Doe	100--120	6	16 - 18	3
5 $\frac{1}{2}$ Buck	159--180	2	19 $\frac{7}{8}$ - 20	2
5 $\frac{1}{2}$ Doe	105--130	3	18 $\frac{1}{2}$ - 19	3
6 $\frac{1}{2}$ Doe	95--120	4	16 $\frac{1}{2}$ - 19	3
7 $\frac{1}{2}$ Buck	185	1	- - -	-
7 $\frac{1}{2}$ Doe	120	1	18 $\frac{1}{2}$	-
10+ Doe	130	-	- - -	-

Hunter Pattern:

Hunting pressure was the heaviest during the first week of the season when 1,349 hunters harvested 198 deer. This represents 34 per cent of the kill for the entire season.

As seen in Figure 4, the number of hunters checking through the stations dropped from a peak of 1,349 the first week to only 227 during the last 4 days of the season. The kill generally followed the hunter pattern,

Figure IV.

DAILY KILL AND HUNTING PRESSURE, 1950

FISHER RIVER

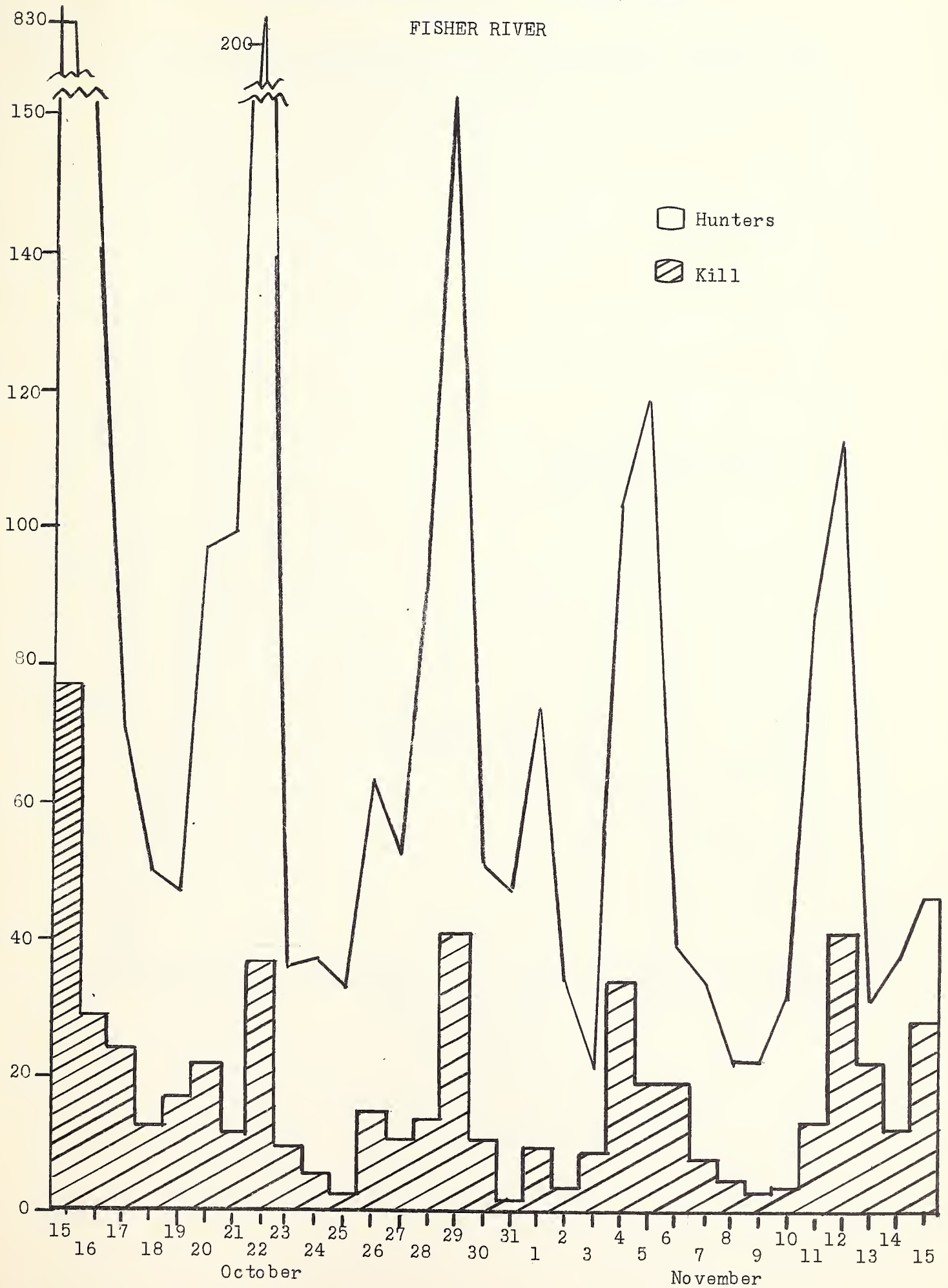




Figure V.

Per Cent of Kill and Hunting Pressure by Weekly Periods, 1950

Fisher River

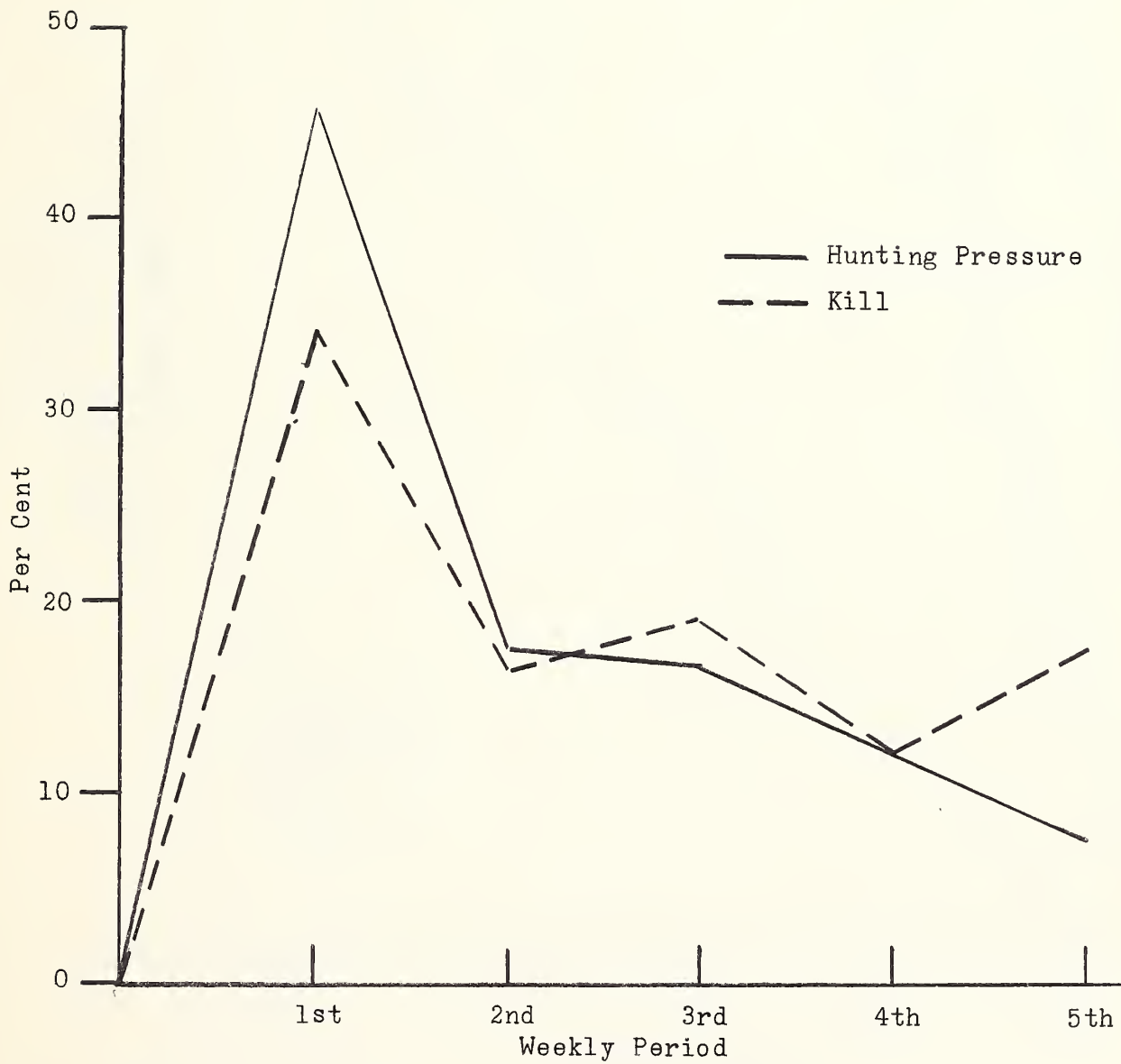






Figure VI.  
CUMULATIVE DEER KILL, 1950

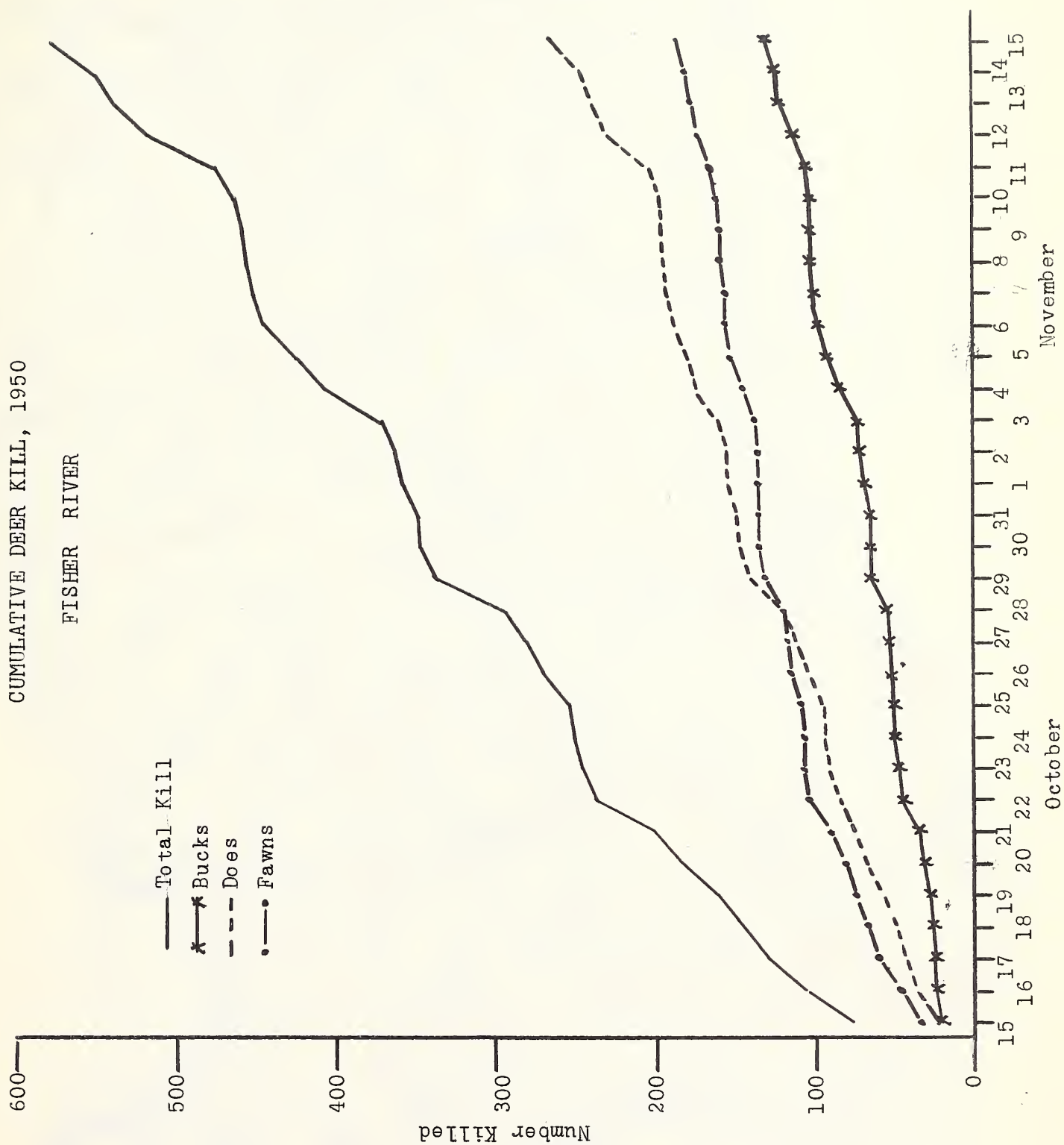






Figure VII. Distribution of Hunting Pressure in the Fisher River Doe Area, 1950.





decreasing from 198 deer the first week to 96 the second, 111 the third and 71 the fourth week. But in the last 4 days, it climbed to 103 deer. This increase is probably due to a number of the hunters being camped in the area. If the party was not successful in filling their quota, they stayed until the end of the season, consequently checking out on the last day with their kill.

An error was made in recording the kills--the date recorded was the date the hunter left the area, rather than the actual date the deer was killed.

The hunting pressure of the 1950 season is quite similar to the 1949 season, except that it was 40 per cent lower the first week of the 1950 season; then it had a tendency to level off and remain approximately the same for each succeeding week. (Figure V.) It is very probable that in 1949 many of the local deer that resided along the roads were killed; consequently causing a much lower kill the first week of the 1950 season.

Fluctuation of the daily kill is shown in Figure VI. The sharp peak on the 15th and 16th of October is due to the large influx of hunters for the first week-end of the season. There was (as last year) considerable week-end hunting, as shown by the peak kills on Sundays.

Figure VI shows the cumulative kill in the Wolf Creek-Fisher River area, and again shows the week-end hunting pressure, except the week-end of November 5th which is undoubtedly due to the opening of pheasant season on this date and probably drew a large number of hunters that otherwise would have hunted deer.

#### Location of Kill:

Locations of 308 kills are plotted on Figure VII. As can be seen, the greatest amount of kills are still made near the roads. Small concentrations of kills on Alder-Cody and Bucky Creeks are due to a new road that was constructed within the last year, which is not indicated on the map. The kills on Dunn Peak, Richards Mountain and Richards Creek are probably due to the hunters operating from the Baenen ranch on Richards Creek where horses and guides are available to the sportsmen. Hunters from the ranch were on horseback and were able to get up into the high country away from the roads.

#### Source of Hunters:

Thirty-one Montana counties and eight other states were represented by hunters in the Wolf Creek-Fisher River area during the 1950 season. States other than Montana represented were California, Oregon, Minnesota, Massachusetts, North Dakota, Pennsylvania, Washington and Wisconsin.

Flathead County, as last year, furnished 1,719 or better than one-half of the total hunters in the area, while Lincoln County was second with 545 hunters. (See Table VI.)

Following in order were Lake, Glacier and Sanders counties. These five counties produced 2,667 hunters, or 90.6 per cent of the total number of hunters in the area. (See Table VI.)

Table VI. Source of hunters in the Wolf Creek-Fisher River area during the 1950 big game season.

County	No. Hunters	Per Cent of Total
Flathead	1719	58.4
Lincoln	545	18.5
Lake	215	7.3
Glacier	126	4.3
Sanders	62	2.1
Other Counties (26)	275	8.8
Out of State (8 States)	16	.6
Total	2,942	100.0

#### Calibres of Guns Used:

Fifty-four calibres ranging from the .22 to the 45-90 and including the 12 and 410 gauge shot guns were used to kill deer in the Wolf Creek-Fisher River area. The most prevalent gun used was the 30-06 with 30-30 a close second. The following table shows the preference and number of calibres used:

Calibre	No.	Calibre	No.	Calibre	No.
1. 30-06	693	19. .22	18	37. .38 Rem.	2
2. 30-30	637	20. .32 Rem.	16	38. .220 Sw.	2
3. .330 Sav.	221	21. .22 HP	15	39. 9mm.	2
4. .32 Spl.	162	22. .32-20	12	40. .30 US Car.	2
5. .270	162	23. 7.62mm.	12	41. .40-82	2
6. .30-40	161	24. .25-20	11	42. .375 Mag.	1
7. .35	109	25. .38-55	8	43. 6mm.	1
8. .25-35	96	26. <del>.38-40</del>	7	44. .38-56	1
9. 8mm.	73	27. .303 Inf.	6	45. .228 Mag.	1
10. .303	64	28. .25-36	6	46. .45-90	1
11. .250-300	51	29. 12 ga.	4	47. 7.25mm.	1
12. .33	36	30. .351	4	48. 44-40	1
13. .25	30	31. .256 Newton	4	49. 7.7mm.	1
14. .348	25	32. 7mm.	4	50. .38 spec.	1
15. .30 Rem.	24	33. .22 Hor.	3	51. 7.65mm.	1
16. .257 Rob.	23	34. .45-70	3	52. .410	1
17. .320-40	21	35. 6.5mm.	2	53. .270 Mag.	1
18. .330 Mag.	18	36. .401	2	54. .06 Mag.	1

#### CONCLUSIONS:

1. Hunter success was .3 per cent higher this season than in 1949.

2. Legal bucks made up 22.4 per cent of the total kill.
3. White-tailed deer made up 82.4 per cent of the harvest.
4. Age composition ranged from 6 months to 10 years and over.
5. Sixty per cent of the deer were  $4\frac{1}{2}$  years old or older, if fawns are excluded.
6. There were more  $4\frac{1}{2}$ ,  $5\frac{1}{2}$  or  $6\frac{1}{2}$  year old deer killed than in the  $2\frac{1}{2}$  or  $3\frac{1}{2}$  year class.
7. Six mature females had produced 10 embryos in the previous year.
8. Hunting pressure was greater in the first week of the season, when  $\frac{1}{3}$  of the total kill was taken.
9. Flathead County provided better than 50 per cent of the hunters.

#### RECOMMENDATIONS:

1. The three checking stations should be continued with two permanent men at each station.
2. Jaw boards with all age classes from 6 months old to 10 and over should be made up for each checking station.
3. Maps, write-up, and pictures of location of reproductive organs should be available to checking station personnel several days before the opening of the season.
4. Collection of female reproductive organs should be continued.
5. Contact should be made with sportsmen's clubs in neighboring counties to acquaint the hunters with the data the checking station will collect, and why such data is essential.
6. Checking station equipment, cooking and eating kits, lanterns, flashlights and miscellaneous tools should be provided by the State Fish and Game Department.
7. Brush Creek checking station should be changed to a more suitable location and the boundary of the area altered to coincide with the station.
8. Cooperation with the Research Unit at Missoula should be continued and some incentive given the student for helping to man the checking stations on week ends to encourage their help.
9. Checking stations should be set up and maintained by the law enforcement division.

Submitted by:

Jack E. Schmautz, Unit Biologist  
Ade Zajanc, Asst. Unit Biologist



STATE Montana  
PROJECT 1-R-10  
DATE April 15, 1951

ABSTRACT

Title of Project: Wildlife Surveys and Management

Most of the activity on this project was devoted to intensive census work on all units. The summarized estimates by units is included below.

Big Game Summary:

Unit	Elk Counted	Total Elk
Blackfoot-Clearwater	540	1058
Swan	380	720
Cherry Creek	412	615
South Fork of Flathead	2038	2038
Bitterroot, East Side	530	750
Sun River	3020	3950
Hound Creek - Elk Horn	172	180
Dry Creek	102	125
Crow Creek	181	200
Bull Mountain	186	200
Canyon Creek - Prickly Pear	253	400
Little Belts	797	800
Totals	8,611	11,036

Unit	Mountain Sheep Counted
Rock Creek	29
Wildhorse Island	30
Billy Creek	39





STATE Montana

PROJECT 1-R-10

DATE April 15, 1951

FINAL PROGRESS REPORT

For

SURVEYS AND INVESTIGATIONS

As Required By

FEDERAL AID IN WILDLIFE RESTORATION ACT

1. Title of Project: Wildlife Survey and Investigation

2. Project Personnel: Lloyd McDowell, Biologist, Leader

Larry Brown, Biologist, Acting Leader

Donald E. Johnson, Jr. Biologist

3. Report of Progress:

Field activity under this project is divided into a series of field jobs which are accomplished on a unit basis. The over-all work plan is devised to determine basic data in each unit. Census techniques are still being tested, but it is believed that the use of aircraft constitutes the most economical and accurate census method for elk counting.

During the past quarter all important game units were examined aurally and in most cases ground work was accomplished in connection with the air coverage.

The following individual reports are presented with brief summaries of methods and conditions so any future work can be patterned and judged accordingly.



WESTERN MONTANA BIG GAME INVESTIGATIONS AND RECHECKS

PROJECT PERSONNEL:

L. E. McDowell, Big Game Biologist

Vern Sylvester, Range Technician

INTRODUCTION:

During the past quarter a large portion of the time was spent doing ground and aerial big game census. Following is a summary of the findings in each area.

BLACKFOOT-CLEARWATER

Date: January 17-19, 1951

Personnel:	Lloyd McDowell	Faye Couey	
	Vern Sylvester	Ken Thompson	
	Fred Hartkorn	Ray Austin	)
	Don Johnson	Paul Choquette	) Pilots
	Larry Brown		

Procedure:

Using a ski-equipped 105 Super Cub plane an aerial census was made of the entire upper Blackfoot-Clearwater region. All winter range was systematically stripped from the air to determine the number of elk in the area and the extent of their range. A reconnaissance was also made of the critical areas by men on foot to determine extent of forage use and snow conditions. Daily field reports were made and filed for future reference and comparisons.

Findings:

The results of the aerial elk count are summarized in Table #1.

Due to the special forage problem in the Salmon Lake Hills area an intensive foot coverage was made. Two hundred fifteen white-tailed deer were counted on approximately three square miles of critical range.

Table 1. Aerial elk census of Blackfoot-Clearwater area.

Area	Bulls	Cows & Calves	Total	Estimate	Total Plus Estimate
Ovando Mountain & vicinity	39	119	158	150	308
Dry Cottonwood	9	38	47	25	72
Bradshaw Ranch		40	40	10	50
Sperry & Boyd Mountain	7	3	10	200	210
Cottonwood Mountain (Fish Lake)	13	95	108	25	133
Double Arrow Ranch	5	5	10	10	20
North Cottonwood Lake	5		5	10	15
Trail Creek	4	4	8	5	13
Placid Lake Hill	2	15	17	10	27
Owl Creek	5	2	7	25	32
Prairie Creek	9	5	14	10	24
Lost Horse Creek	2		2	3	5
Blanchard Creek	10	28	38	10	48
Belmont Creek	17	59	76	25	101
Totals	127	413	540	518	1058

#### SWAN VALLEY

Date: January 21-24, 1951

Personnel: Lloyd McDowell      Ken Thompson  
               Vern Sylvester      Larry Brown  
               Fred Hartkorn      Ray Austin - Pilot  
               Don Johnson      Students  
               Faye Couey

#### Procedure:

Approximately the same aerial procedure was used in the Swan as was used in the Blackfoot-Clearwater area. The white-tailed deer strips set up in 1943 were again repeated.

#### Findings:

On the following page is Table 2 showing the results of the aerial elk count.

The results of the intensive strip census and winter study of the White-tailed deer showed that the herd is in a static condition. Eighteen strips were walked covering 1,500 acres of winter range. On the 1,500 acres 111 deer were counted. This resulted in one deer for every 13.51 acres on a range of 91,600 acres which was determined by outlining the winter range from the air. The computed total count in the Upper Swan Drainage was 6,785 white-tailed deer.



Table 2. Swan aerial elk count - January 23, and 24, 1951.

Area	Bulls	Cows & Calves	Total	Estimate	Total Plus Estimate
Rumble Creek	15	47	62	13	75
Spook Ridge	1	15	16	9	25
Beaver Divide	1	10	11	4	15
Fry Place	1	14	15	10	25
Barber Creek (3 mule deer bucks)				10	10
Clearwater Lake	3	4	7	3	10
Elbow Lookout		16	16	4	20
Head Elbow Lake	1	12	13	7	20
Glacier Creek	2		2	3	5
Hole-in-Wall		5	5	10	15
Elk Creek	2	4	6	9	15
Alder Creek	5	45	50	10	60
Lion Creek (2 goats)	5	36	41	19	60
Napa	45	56	101	49	150
South Lost Creek	3	24	27	23	50
Bond Creek (6 goats)		8	8	7	15
Bond Creek - North to Echo Lake area--not counted due to bad weather.			?	150	150
Totals			380		720

#### THOMPSON FALLS AREA

Date: February 14 - 17, 1951

Personnel:	Lloyd McDowell	Robert Greene
	Vern Sylvester	Faye Couey
	Fred Hartkorn	Ken Thompson
	Wm. Bergeson	Lon Cheney
	Wynn Freeman	Paul Choquette - Pilot

#### Procedure:

The procedure here was also similar to that used in the Blackfoot-Clearwater and Swan Valley. As the aerial count was made, personnel on foot and in jeeps did reconnaissance work. White-tailed deer census strips set up in 1948 were again repeated.

#### Findings:

The results of the aerial count are summarized in Table 3.

The intensive strip count made on the Thompson River area resulted in the coverage of 4,360 acres on which 277 deer were actually counted. This gave us 16.7 acres per deer on the winter range; however, the past winter was so mild and the extent of the range so large that practical

conclusions to the total number of white-tailed deer in the area were not feasible.

Table 3. Cherry Creek aerial census of elk, February 14, 1951.

Area	Bulls	Cows & Calves	Total	Estimate	Total Plus Estimate
Cherry Creek and Dry Creek	69	253	322	78	400
Surrounding Area to West	17	73	90	50	140
Swamp Creek area				75	75
Totals			412	203	615

#### SOUTH FORK OF THE FLATHEAD

Date: February 27 to March 13, 1951

Personnel:	Lloyd McDowell	Ken Thompson	
	Vern Sylvester	Ade Zajanc	
	Fred Hartkorn	Jack Schmautz	
	Wynn Freeman	Ray Austin	) Pilots
	Robert Greene	Paul Choquette	
	Frank Gummer		

#### Procedure:

A follow-up of the winter work of 1948-49 was thought possible by the use of 8 men and two airplanes over a period of 10 to 14 days. Two men were ferried to each major station with a Stinson Voyager and left to cover the area around the station as they saw fit by a preliminary flight over the region. A 105 Super Cub plane was used entirely to do the census work. Both planes were equipped with skis and operated from snow-covered air strips in the Primitive Area.

#### Findings:

The findings of the aerial count are summarized in Tables 4 and 5.

From the reports of ground personnel, it was found that there were 30 to 40 inches of snow in the Basin Creek-Danaher area, an all-time record. The forage in this area was in a deplorable condition and the number of elk, especially calves, was very low when compared to other years.

Although the total count for the South Fork of the Flathead elk range was higher than in 1948, the upper portion of the drainage had approximately 300 less elk. The large count in the Spotted Bear area more than made up the difference.

Table 4. Big Prairie aerial census. March 1951.

Sub-unit	Total
Danaher	58
Basin Creek	46
Hahn Creek	174
Gordon Creek	3
Big Prairie	163
White River	134
Holbrook	125
Big Salmon	50
Little Salmon	14
Total	767

Table 5. Spotted Bear Creek aerial census, March 1951.

Sub-unit	Total
Black Bear	75
Meadow Creek	54
Gorge	99
Limestone )	
Spotted Bear )	861
Elk Park )	
Elk Park to Hungry Horse Dam	182
Total	1,271

Comparison of Counts

	<u>1951</u>	<u>1949</u>
Spotted Bear	1271	725
Big Prairie	767	1030
Total	2038	1755

Over-all gain 283

Even with the reduced number of elk in the upper area, there is a serious lack of winter forage for the elk now wintering there. Future management should tend to reduce the numbers by added hunting pressure which may help force a migration to the Sun River or Blackfoot Game Ranges.

AERIAL MOUNTAIN SHEEP CENSUS

Rock Creek Area	
Mature Rams	8
Small rams, ewes, lambs	<u>21</u>
Total	29
Wildhorse Island	
Mature Rams	7
Small rams, ewes, lambs	<u>23</u>
Total	30

RECOMMENDATIONS:

1. Blackfoot-Clearwater
  - a. Regular elk season
  - b. Doe season on deer north of Seeley Lake
2. Swan
  - a. Regular elk season. Extend bull season if kill is low.
  - b. Take 1,000 deer of either sex, starting October 15, 1951. Have checking station north of Seeley Lake and near Swan Lake.
3. Cherry Creek
  - a. October 15 to November 15 season on antlered elk.
  - b. Harvest 300 doe deer in Thompson River Drainage. (Have entire drainage open)
4. South Fork of Flathead
  - a. Elk season September 15 to November 15 on either sex in upper area.
  - b. Buck deer season to conform with above (September 15 to November 15).
  - c. Season on mountain goat from September 15 to October 15.

Submitted by:

Lloyd McDowell, Big Game Biologist  
Wildlife Restoration Division

Vern Sylvester, Range Technician  
Wildlife Restoration Division

## BIG GAME SURVEY - BITTERROOT UNIT

### DATES:

January 26, 27, 28, 29, 1951

### PERSONNEL:

Lloyd McDowell	Clyde Howard
Vern Sylvester	M.J. Watt
Don E. Johnson	Wm. Ammerman
L. E. Brown	W. K. Thompson

### INTRODUCTION:

Original work plan for big game census in the Bitterroot Valley called for coordinated survey work with air and ground crews.

However, due to high winds and fog it was necessary to delay the aerial work. Thus the ground crews had completed coverage before the work by air had commenced.

It was found consistently that air census was far superior to ground census. However, it cannot completely supplement ground work as details of forage use, winter conditions and sex ratios must be determined by the crews working on the range.

Table 1. Big game census (ground coverage) - East Fork, Bitterroot Unit.

Drainage	Deer	Elk	Elk Estimated
Tolan - Mink Creek	8	27	50
Camp Creek - Tolan	1	6	35
Cameron Creek		4	15
Shirley Mountain	6	51	75
Shirley Mtn. & Cameron Cr.		31	50
Total East Fork		119	225

Classified elk = 1 cow : .85 calves and 12% bulls.



Table 2. Aerial big game census - Bitterroot Area (East Side).

Drainage	Deer	Elk
Girds Cr. to Willow Cr.		84
Skalkaho Ridge		109
Willow Creek to Burnt Fork		37
Burnt Fork to Eight Mile		19 (est.)
Sleeping Child to Harlan Gulch	150	
Rye Creek	63	58
French Basin to Bunch Gulch	27	126
Tolan Creek to Springer		8
Tolan Creek to Camp Creek	24	72
Bunch Gulch to Tepee Creek	43	17
Sula to Rye Creek (East Side)	249	
Total	556	530

Total estimate for East Side Bitterroot - 750

## AERIAL SURVEY - SUN RIVER

### DATE:

February 23rd, 1951

### PERSONNEL:

Paul Choquette, Pilot

R. F. Cooney, Observer

### AIRCRAFT:

Cub Cruiser

### FINDINGS:

Departure from the Helena airport was at 9:30 a.m. with bright and clear weather and a temperature of approximately 15°. A new snow had fallen a day before the flight. This made track observations important.

We flew over the Dearborn area. The first elk observed on the Sun River Unit were 35 scattered in several bunches on the west slope of Haystack Mountain. There were 55 elk in several small groups between Ford and Smith Creeks. No elk were observed in the vicinity of Willow Creek camp. Thirty-four elk were seen outside of Lime Reef.

On the Game Range proper, numerous tracks were noticed in the timber under the Sawtooth Reef, but no elk were seen in this area. A fair number could have been in the deep timber in that area.

Forty-nine elk were observed over near the Brusgard cabin on the north side. Fifty-two elk, mostly bulls, were noticed on the rough ridge on the north side east of the Brusgard cabin. A very large herd of elk was lying in the northeast corner on the open grassy rolling range. These were loosely distributed in one band. It was possible to only make a rough estimate of numbers; however several pictures were made and from these it was determined that 2,500 elk were in the open range area.

Forty-three elk were noticed to the south of this big band on the east side of the range. There were also 19 elk in this same area. Just to the south of these was found another medium-sized band of elk. The number was determined from pictures which were taken and added to the main herd count.

Snow conditions on the range were not at all adverse for elk grazing. Apparently a strong wind had accompanied the recent snow storm so that the prairie portion of the range was covered by only 2 or 3 inches of light snow. Tracks again indicated that the elk were feeding very widely over the entire prairie portion of the range. It was also very obvious that they were utilizing salt which had been placed out in this area.

We then flew up over the Gibson Lake. Thirty-eight elk were noticed in lower Hannan Gulch on the east side. Twenty-three were seen in a small group on lower Big George. Thirty head were seen on Scattering Springs, and 2 elk on Sheep Ridge.

Due to down-draft conditions, the upper portions of these drainages were not covered thoroughly. However, distant observations did not reveal any numbers of tracks.

The North Fork was covered as far up as Cabin Creek. No elk were seen and tracks were very scarce. Snow was quite deep. Elk Hill was covered completely with snow--possibly sufficiently deep to obscure all evidence of grass. This condition was true of most of the North Fork area. It is possible that between 25 and 50 elk are using this general vicinity, mostly down along the river. Twenty-seven elk were seen on Pretty Prairie.

There was no evidence of elk around the West Fork lick. We did not fly far up the West Fork, however.

We saw no evidence of elk below Benchmark on the sidehills or bottoms. Snow appeared to be fairly deep in this area.

Approximately 10 head of elk were seen on the sidehills above Wood Lake.

Fifty-four elk were seen on Ford Plateau. There was a considerable amount of snow on this range. The elk had been feeding along the upper rim.

Slightly over 100 head were noticed on Fairview Plateau. Bob Neal mentioned that he had herded these over there from Ford Plateau only a day or two before our flight. He counted the group as containing 115 elk.

#### SUMMARY:

The majority of the Sun River elk herd is now out on the game range, with only scattered bands in outside areas.

Area	Elk Seen
Haystack Mtn.	35
Ford & Smith Creeks	55
Lime Reef	34
North Brusgard	49
NE Brusgard	52
Game Range	2500
Hannon	38
Big George	23
Scattering Springs	30
Sheep Reef	2
North Fork	50 (est.)
Pretty Prairie	27
Wood Lake	10
Fairview	115
Total	3,020

AERIAL ELK RANGE SURVEY

Hound Creek - Elk Horn

DATE:

February 23rd, 1951

PERSONNEL:

Paul Choquette, Pilot

R. F. Cooney, Observer

FINDINGS:

On the return trip from the Sun River inspection, we flew over Craig and thence in a southeasterly direction toward the head of Elkhorn Creek and Hound Creek. We observed the following groups of elk: 7, 22, 51, 48 and 44, all in the general vicinity of the head of Cottonwood Creek--that is, between the head of Cottonwood and the head of Elkhorn Creeks. A total of 172 elk were seen.

No evidence of elk was seen at the head of Hound Creek or Elk Ridge.

Submitted by:

R. F. Cooney, Director  
Wildlife Restoration Division





BIG BELT - BOULDER UNIT

Dry Creek Elk Census

DATE:

March 20, 1951

PERSONNEL:

Faye M. Couey

Ray Austin, Pilot

PURPOSE:

Because this elk herd has not been censused for two years, it was felt by all concerned that a count should be made.

PROCEDURE:

A flight was made from the Helena airport using the department-owned Piper 105 Cub. The area was reached around 8:30 a.m. at which time most of the elk were bedded down. Conditions were good for observation and by following tracks the elk were routed to their feet and counted quite accurately. Coverage was made of the area between Six-Mile and the North Fork of Deep Creek excepting some of the rolling hills at the head of Deep Creek where extreme turbulence prevented adequate observation.

FINDINGS & CONCLUSIONS:

All of the elk seen were found on Dry Creek. They were scattered in small groups throughout the lower drainage as far down as the flat country. Of 102 elk seen there are 22 bulls included. Seventeen of these bulls were adults. This sex ratio indicates that the area could stand a limited bull season without decreasing the herd appreciably. This range is not stocked to capacity and until there are objections the herd should be allowed to increase.

There have been some complaints from the Hoppe ranch this winter relative to elk damage. The area was covered and no elk seen. However, the timber is quite thick in this vicinity and a few tracks indicated that there is a small herd near here. The one haystack was adequately fenced by camouflage wire netting panels which this department supplied.

Submitted by:

Faye M. Couey, Big Game & Lands Biologist  
Wildlife Restoration Division



BIG BELT - BOULDER UNIT

Crow Creek Elk Census

DATE:

March 20, 1951

PERSONNEL:

Faye M. Couey

Ray Austin, Pilot

PURPOSE:

Considerable controversy has existed among ranchers, sportsmen and the Forest Service regarding the number of elk in this area. This information is necessary before recommending a season.

PROCEDURE:

The department-owned Piper Cub 105 airplane was used to fly this area. Counting began about 7:30 a.m. and conditions were good for observation. All known elk range was covered thoroughly.

FINDINGS:

At the head of Dry Creek 2 cow elk were seen. Johnny Gulch was covered completely and no elk were seen. A few old tracks were observed, but no doubt those elk moved north towards Crow Creek.

On Crow Creek near Eagle Station were seen the following groups:

	7 elk (1 spike)
	71 elk
	95 elk (5 spike)
	<u>6 elk</u>
Total	179
	<u>2</u> (Dry Creek)
	181 elk in this area

CONCLUSIONS:

This group of elk has been increasing each year for several years. There has been a short bull season for the past three years with not very large kills.

No adult bulls were seen on this flight indicating that there are probably a few scattered in the more remote parts of the area.

This herd is wintering entirely on the national forest and no evidence of excessive competition with domestic livestock has reached this office.

Because so few bulls were seen on this census, no bull season is recommended. If the herd is reduced, it should be done using special permits.

It is felt that this herd is under its carrying capacity and, until evidence of excessive range use is found, it should be allowed to increase.

Submitted by:

Faye M. Couey, Big Game & Lands Biologist  
Wildlife Restoration Division

BIG BELT - BOULDER UNIT  
Bull Mountains Elk Census

DATE:

March 20, 1951

PERSONNEL:

Faye M. Couey

Ray Austin, Pilot

PURPOSE:

Information relative to elk population in this area was desired in order to determine type and length of season.

PROCEDURE:

The department-owned Cub 105 airplane left Helena one-half hour before dawn and a complete coverage made of the Bull Mountain range south of Boulder.

FINDINGS:

A swing was made west of Boulder to Galena Gulch where 40 elk were seen. This is a local herd and probably are not Bull Mountain elk.

Then a complete coverage of the Bull Mountain range was made and the following elk seen.

Head of Whitetail Creek:

3 Bulls  
5 Bulls (3 spikes)  
11 Cows and calves  
6 elk (4 bulls)  
6 bulls (8 mi. north of Whitehall)

Swampy Park:           55 elk  
                          2 bulls

Brady Cr. (On flats) 50

Hadley Park           35

Hadley Park           13

Total                186 (20 bulls)

This coverage, it is felt, was quite accurate as counting conditions



were ideal and enough time was spent combing the terrain and following up tracks that very few elk could have been missed.

The west side of Whitetail Creek in the Dry Range area was not covered due to very rough air in that section. A few elk have been seen there in previous counts, and the area has a reputation for running rather heavy to bulls.

#### CONCLUSIONS:

The population of elk on Bull Mountain proper is such that with the coming calf crop there will not be many more than the 200 elk that the ranchers have agreed to carry there.

It is recommended that there be no season this year or at most, a few days on branch antlered bulls. If damage occurs on the Boulder River side, a few special permits can be issued for that area.

Submitted by:

Faye M. Couey, Big Game & Lands Biologist  
Wildlife Restoration Division

## AERIAL ELK SURVEY

Canyon Creek - Lincoln-Dearborn

### DATE:

March 21, 1951

### PERSONNEL:

Paul Choquette, Pilot

W. K. Thompson, Observer

### AIRCRAFT:

Piper Cub 105 - Department 2-place airplane.

### CONDITIONS:

The crew left Helena airport at 7:05 a.m. and returned at 9:45 a.m. Conditions were not ideal for several reasons: There was a haze which prevented ideal visibility, rather severe turbulence with winds 25-35 m.p.h. reduced effective observations, and melting snow conditions made use of tracks and pawing ineffective as a key to game locations.

An additional retarding factor was the probability of animals grazing at night due to bright moonlight. Many deer and elk were bedded by 8:00 a.m.

### RESULTS:

Location of animals is indicated on the attached map and the following tabulation shows the drainages where deer and elk were seen.

#### TABULATION OF GAME SEEN

	<u>Elk</u>	<u>Deer</u>
Granite Peak	56	91
Virginia Creek	15	6
Seven-up	19	
Horse Fly	4	
Fleisher		5
Middle Fork Dearborn	55	
Lyons Creek	11	
Big Sheep Creek	93	
Total	253	102

### CONCLUSIONS:

Aerial coverage of this area should be in January or February, prefer-

ably following a fresh snow. It is known that elk were missed around Granite Peak as 120 were seen there in February.

Submitted by:

W. K. Thompson, Assistant Director  
Wildlife Restoration Division



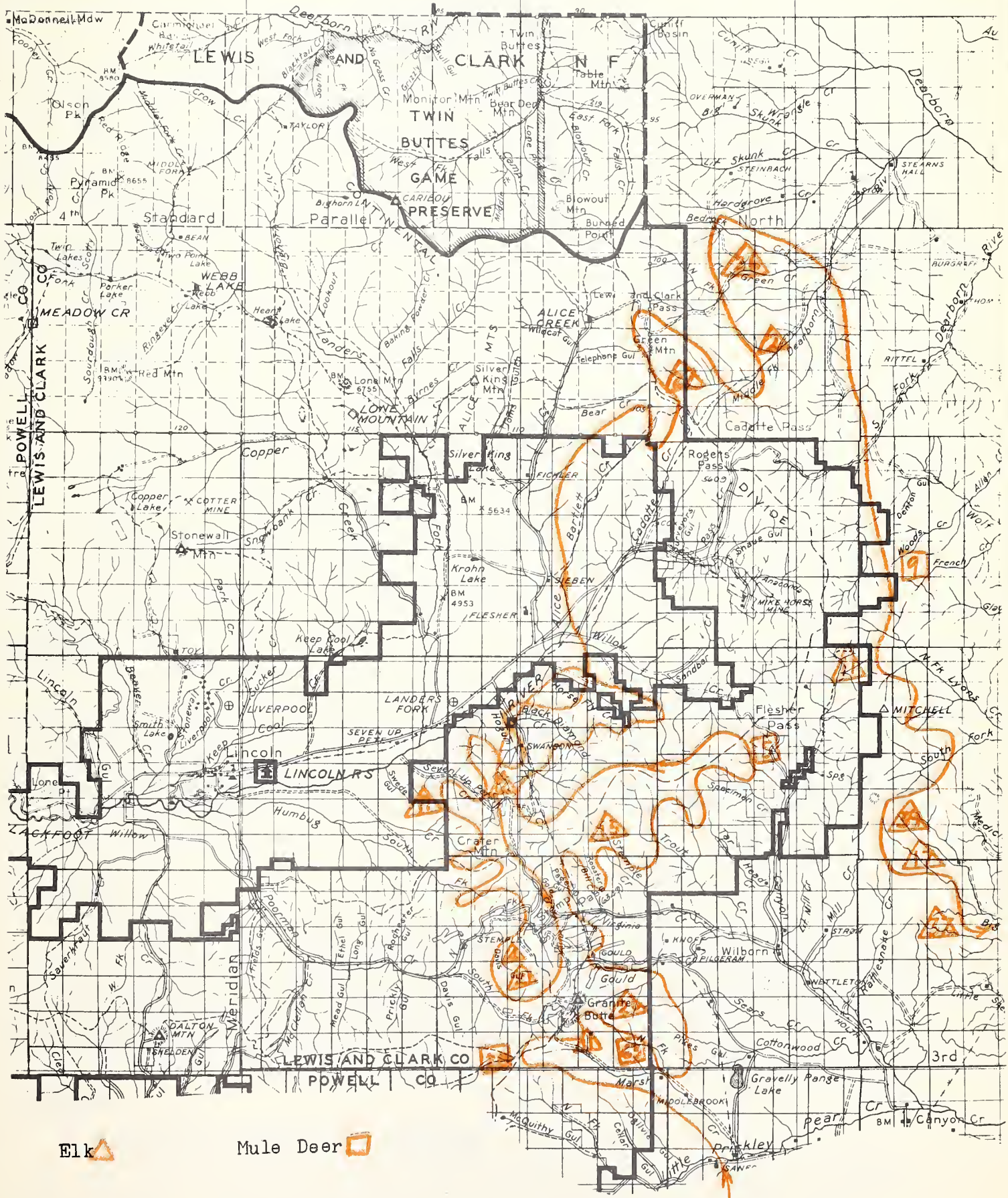
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Aerial Survey - Canyon Cr.-Dearborn, March 21, 1951





## LITTLE BELT UNIT

### Winter Range Elk Count and Range Investigation of the Little Belt Mountains

#### DATE:

February 1-4, March 12, 1951

#### PERSONNEL:

Faye M. Couey, Big Game and Lands Biologist

Lloyd McDowell, Unit Biologist

Larry E. Brown, Junior Biologist

Daniel G. Massing, Ranger, U. S. Forest Service

Ray Austin, Pilot, Montana Fish and Game Department

Waldo G. Vangsness, Deputy Game Warden

Donald E. Johnson, Junior Biologist

#### PURPOSE:

In addition to the annual elk count in the Little Belt Mountains, a rapid visual range use inspection was made in some of the elk concentration areas. It was also desirable to determine the effect of the new administrative closure (Middle Fork of the Judith River) on elk distribution in the northern part of the mountains. Numbers were particularly checked in the vicinity of and on the Judith River Elk Acquisition. The actual counts were made according to sub-units.

#### PROCEDURE:

The group met at the Judith River Elk Acquisition headquarters on February 1. Very poor flying conditions prevailed. The first four days were taken up with range inspections. Much of the area was covered by jeep pickup, with some walking. An incomplete count was made February 4 with the Department Piper PA 18 airplane. On March 12 a more complete count was made in a rented Cessna 170 by Vangsness and Johnson.

#### FINDINGS:

##### Sub-Unit 4 (Musselshell Drainage)

On this side 309 elk were counted (1950 count, 307). Only 18 bulls were observed. The elk were found in open areas adjoining timber lands.

Counting conditions were ideal.

#### Sub-unit 2 (Judith Drainage)

This count, made March 12, found 488 elk wintering on this drainage. Some estimates had to be made as many elk were in the timber. No doubt some were missed. Last year's count found 585 in this area. On and around the acquisition 360 head were counted. An estimate of 50 head was made for the Dry Wolf area in the northern part of this range of mountains.

On some of the concentration areas rather heavy range use was encountered. Woodchopper Ridge, Beldon Flats, and Brome Grass Flats showed considerable use which was partly attributed to the fact that hunters had not allowed the elk free distribution on the lower areas. Some of the pressure was relieved at the close of the hunting season at the end of February. Many of these areas are within Forest Service livestock allotments which make them subject to summer and fall range use.

#### CONCLUSIONS:

It is believed that this count was not quite as complete as the previous March count due to weather and aircraft rental conditions.

The Middle Fork administrative closure appears to have contributed much to the northward distribution of the elk into wintering areas not previously occupied by them. The opening of the old closure to hunting apparently caused the elk to move north into the new closure with some of them drifting further north to new areas (Dry Wolf and vicinity). Certain damage complaints have arisen in this northern area but have been held to a minimum due to efforts of Warden Loberg of Stanford who has supported the ranchers in fencing their haystacks.

The acquisition appears to be serving its purpose by relieving extensive elk use on private holdings. Last winter 380 elk were on this range, while the last count found 360 in the same area.

The range inspection trips indicated the need of future range studies, particularly with regard to utilization, trend and condition. These studies will be initiated during the spring, in cooperation with District Ranger Massing.

Using the 1950 March count of 892, plus an estimated 20 per cent calf crop, the 1950 summer herd was approximately 1070 head. The total drain of 173 bulls and 54 cows and calves (Deputies Loberg and Fallang) should have left a calculated winter population of 843 elk. The total count was 797 head. This difference is rather small when it is considered that the annual increase figure is only hypothetical and unproven for this area.

The March counts for the last three years have indicated a decreasing number of wintering animals: 969, 892, and 797, respectively, for 1949 through 1951. This seems to indicate the drain has exceeded the increase.

RECOMMENDATIONS:

In view of the impending range study, it is recommended that the same hunting seasons be adopted in 1951 as prevailed during the 1950 season (regular 30 day bull season plus the extended either-sex season on 100 animals.)

These recommendations should be subject to change if the findings of the range investigations prove the need for such change.

Submitted by:

Donald E. Johnson, Jr. Biologist  
Wildlife Restoration Division

March 23, 1951



## YELLOWSTONE UNIT

### Pine Ridge Winter Elk Aerial Recheck

#### DATE:

February 12, 1951

#### PERSONNEL:

Waldo G. Vangsness, Deputy Game Warden

Raleigh Shields, Deputy Game Warden

Donald E. Johnson, Junior Biologist

#### INTRODUCTION:

The Pine Ridge area lies mainly in northern Big Horn County with its northern slopes extending into southern Yellowstone County. This area, consisting of approximately 198 square miles, is characterized by scattered yellow pine (Pinus ponderosa). The dominant grass species is western wheatgrass (Agropyron smithii) while buffaloberry (Shepherdia argentea) and chokecherry (Prunus melanocarpa) are the dominant shrubs (Thompson, W. K., 1943, Big Game Planning and Wildlife Resource Inventory of Eastern Montana, Wildlife Restoration Division Report).

During the 1950 Yellowstone National Park elk reduction program 24 of the trapped elk were transplanted, at sportsmen's expense, in the Pine Ridge.

#### PURPOSE:

To determine the total number and distribution of elk within the Pine Ridge area in order to evaluate the success of the transplant.

#### PROCEDURE AND FINDINGS:

A Cessna 170 type aircraft was rented from the Johnson Flying Service of Lewistown and piloted by Deputy Vangsness. Flight strips 12 miles long, beginning approximately 2 miles south of Pompey's Pillar, were flown in a northeast direction with reciprocal flights. The width of the strips varied considerably due to the broken terrain.

Although fresh snow aided the count, overcast skies imposed a handicap, in that, tracking was made difficult due to lack of shadows.

One bunch of 23 elk were encountered just under the northeast point of the ridge on the north side. Only one bull was observed, this being either a yearling or a 2 - 3 year old. Four calves were positively identified. No other elk were observed although approximately 28 mule deer including 6 very large bucks were seen.



#### CONCLUSIONS:

All participants agreed that few elk were missed due to the thorough area coverage. However scattered singles could have escaped count in the timber.

The Cessna 170 was too fast an aircraft for desirable counting and sexing on this job.

Snow depth presented no hinderance to elk movements and foraging, consequently, it is doubtful if any depredations will occur on local haystacks.

It is believed that this herd could be built up to huntable numbers under a permit system if proper management practices were employed.

#### RECOMMENDATIONS:

Annual winter rechecks should be continued. Also spring ground checks should be made in order to determine the extent of any winter losses as well as range use by the elk.

Submitted by:

Donald E. Johnson, Junior Biologist  
Wildlife Restoration Division

BIG BELT - BOULDER UNIT

Limestone Hills Deer Count

DATE:

January 12, 1951

PERSONNEL:

George Engler, U. S. Forest Service

Wynn Freeman, Biologist

Ken Sears, Deputy Game Warden

Faye Couey, Biologist

PURPOSE:

Continuity of information is desired on this important mule deer winter range as a basis for management recommendations.

PROCEDURE:

Coverage was made as in previous years. Two men started near the Hough Cut-off traveling south and two men traveled north from the Dowdy ranch. Travel was on foot, and binoculars were used to classify the deer.

FINDINGS:

There was just a little snow on the ground and travel conditions were good. Classification conditions were not ideal as the date was too late. Ideally this should be done shortly after the rut. The bucks were separated from the main herds, making our buck count low.

There were 26 adult bucks, 20 yearling bucks, 223 fawns and 334 does counted as classified and 100 unclassified deer seen. Total classified deer was 603.

The buck-doe ratio was one buck to 7.2 does. Bucks constituted 7 per cent of the herd, does - 66 per cent, and fawns - 37 per cent. There was a ratio of one doe to .7 fawns.

Total area covered was about 3 sections, giving a population of 234 deer per section. Three crippled deer were seen--no doubt hunting season wounds.

Tracks were seen of two coyotes.

Range conditions are poor. The mountain mahogany which has been used as an index in this area is now heavily hedged with current use. The juniper is fairly heavily used; in some cases plants are dead. Grass and forb growth

was good this past season, but its use by domestic livestock was heavy in this area.

The Dowdy ranch hay meadow is still quite an attraction for deer and may account to some extent for the extreme concentration of deer nearby. The area counted is no doubt the most thickly populated portion of the Limestone Hills. However, there are deer in all parts of these hills making a very large over-all population. Several complaints of damage have been registered by local ranchers.

#### CONCLUSIONS & RECOMMENDATIONS:

1. The Limestone Hills Big Game Closure which was modified for the 1950 hunting season had no appreciable effect on the deer population or distribution. It is accordingly recommended that this closure be abandoned.

2. In order to keep this deer herd from eliminating itself, it is recommended that there be a special antlerless deer season to be held after the regular buck season. The date, description of area and number of deer to be taken may be decided upon later this coming fall.

Submitted by:

Faye M. Couey, Big Game & Lands Biologist  
Wildlife Restoration Division

## MISSOURI BREAKS UNIT

### Billy Creek Mountain Sheep Recheck

#### DATE:

January 10 and February 20, 1951

#### PERSONNEL:

Ed DuBeau, Deputy Game Warden, Fort Peck

Cliff Wolf, Patrolman, Fort Peck Game Range

Larry E. Brown, Junior Biologist

Donald E. Johnson, Junior Biologist

#### INTRODUCTION:

On November 16, 1947, 16 bighorn sheep from the Tarryall herd of Colorado were released in the Missouri River Breaks on Billy Creek (in north-west Garfield County). The release was made in a pasture consisting of 328 acres, which was fenced under Project 22-D.

Fifteen sheep were known to have escaped from the enclosure which contained 32 head. This reduced the enclosed herd to 17 in 1949.

#### PURPOSE:

Periodic rechecks are necessary to inspect water facilities, fences and observe numbers, mortality, and wintering conditions.

#### PROCEDURE:

On January 10, Brown and Johnson covered the entire pasture on foot. The pasture area was later flown by DuBeau and Wolf on February 20, in a Piper PA 18 aircraft.

#### FINDINGS:

Very little snow was present in the area (approximately 1 to 2 inches) with all forage available, except that in the gully bottoms.

Seventeen sheep were encountered at the north end of the pasture. Two of these appeared to be mature rams. One dead ram was found among some Douglas fir near the center of the pasture on a gully slope. Decomposition was too far progressed to determine the cause of death. The estimated time of death was in September or October. The estimated age of the ram, by the questionable "annual horn ring method", was 4½ years.

The findings of DuBeau and Wolf were limited to the area outside the pasture where counting conditions were apparently very good. The 22 sheep

observed were in three bunches of 11, 6, and 5, located northeast of the pasture. No sex counts were made, although several rams and lambs were seen.

A gap between the hog-wire fence, north of the trash gate, was found and repaired.

#### CONCLUSIONS:

A total of 39 mountain sheep were observed during the two counts--17 inside and 22 outside the pasture. It is believed that some were missed, particularly inside the pasture.

Foraging conditions were very good with respect to snow cover.

Apparently a very desirable herd increase is taking place.

#### RECOMMENDATIONS:

Rechecks should be continued. Monthly rechecks during the summer and fall are necessary to check the springs which are known to silt up rapidly. Dynamiting has helped relieve this problem considerably. Spring inspections should be conducted to check forage utilization, springs and lambing success.

Periodic fence inspections are necessary until the purpose of the pasture is believed to have been accomplished.

Submitted by:

Donald E. Johnson, Junior Biologist  
Wildlife Restoration Division

March 21, 1951



STATE Montana  
PROJECT 35-R  
DATE: April 15, 1951

ABSTRACT

Gallatin Management Unit

Ground and aerial census of most important game ranges was accomplished during this quarter. Aircraft census was found to be most economical and accurate.

Summary of Big Game Census

<u>Area</u>	<u>Elk Counted</u>
Blacktail Area	906
Madison (East Side)	420
Fleecer - High Rye	432
Upper Big Hole	271
Ruby River	<u>85</u>
Total	2,114

<u>Area</u>	<u>Moose Counted</u>
Big Hole	216

<u>Area</u>	<u>Mule Deer Counted</u>
Ruby River	1470
Scudder Creek	400 (est.)
McKay	<u>336</u>
Total	2,206



STATE Montana  
PROJECT 35-R  
DATE April 15, 1951

QUARTERLY PROGRESS REPORT

For

SURVEYS AND INVESTIGATIONS

As Required By

FEDERAL AID IN WILDLIFE RESTORATION ACT

1. Title of Project: Gallatin Management Unit

2. Personnel: J. E. Gaab, Biologist

Norman Wortman, Fieldman

3. Report of Progress:

Field activity consisted primarily of big game census work by air and ground on the several sub-units in the area.

Search for ear-tagged calves continued in the Gallatin with considerable success.

Reproductive tracts, fetuses and lower jaws were examined or collected from about 1,000 elk. These data will be analyzed as soon as possible.

Assistance was given in acquisition areas of the Gallatin and Madison.

Individual area reports follow.



BLACKTAIL AERIAL ELK CENSUS

AND

GRAVELLY-SNOWCREST MOUNTAINS ELK HERD RELATIONSHIP

DATE:

February 20-22, 1951

PERSONNEL:

Ray Austin, Pilot

Joe E. Gaab, Biologist

PURPOSE:

To make a total population census of the elk wintering within the Blacktail Creek Drainage and adjacent areas.

PROCEDURE:

Complete coverage of the area was made after a fresh snow, in the state-owned Piper Super Cub 105 airplane.

FINDINGS:

1. Three hours and fifty-five minutes were required to make complete coverage of the area.

2. Elk were grouped and it was cold enough that they remained in the open during the day. A fresh snow made it quite easy to accomplish an accurate census.

3. Pictures were taken from the air of bands not easily counted while circling in the air. The pictures were enlarged and the elk pinpointed, thus providing a check on individual band numbers.

4. Total elk counted are given in Table 1 below.

Table 1. Blacktail elk census.

No. of Elk	Location
105	Hogback Mountain Slope
94	Jakie Creek
110	Smallhorn Creek
2	Clarks Canyon
21	Cottonwood Creek
28	Head of West Fork of Blacktail Creek
6	Teddy Creek
40	Lower Fork of Blacktail Creek



Table 1. Blacktail elk census (continued).

No. of Elk	Location
21	In 4 groups on Lower Fork
32	Lower Fork
64	East Fork Mouth of Indian Creek
43	East Fork below the Mouth of the Canyon
214	East Fork below the Mouth of the Canyon
<u>126</u>	East Fork below the Mouth of the Canyon
906	Total Elk Herd

5. Wintering conditions as could be observed from the air:

The snowfall to date has been below normal. The elk were at high elevations and not impeded in any way by snow.

HISTORY:

1949 Harvest Blacktail Area	600
March 1950 Aerial Census in Blacktail Creek	1322
April 1950 Aerial Census in the Ruby River	159
April 1950 Aerial Census in the Gravelly Range	<u>182</u>
Total elk wintering between the Madison and Beaverhead Rivers in 1949-1950	1,663
<hr/>	
1950 Harvest in Blacktail Area	491
1950 Harvest in Ruby River	476
1950 Harvest on West Side of Madison River	<u>96</u>
Total Elk Harvest between the Madison and Beaverhead Rivers - 1950	1,063
<hr/>	
1951 Aerial Census in the Blacktail Area	906
1951 Aerial Census in the Ruby River	85
*1951 Aerial Census in the West Side of the Madison River	<u>80</u>
Total elk wintering between the Madison and the Beaverhead Rivers in 1950-1951	1,071

CONCLUSIONS:

1. By calculating twenty-eight per cent calf crop (equal to 22 minus per cent annual increase) of the 1,663 elk or 465 calves, a huntable herd of 2,128 animals is indicated. After a harvest of 1,063 an arithmetical herd indicates that there should be 1,065 animals during the winter of 1950-51. By aerial count and ground observations 1,071 elk are accounted for.

Forty-two elk were counted in the Elk Lake area and thirty-two were counted in the West Fork of the Madison River that had been undiscovered in previous years and therefore not included in the above calculations.

\*Estimated from ground observations.

2. The Blacktail Creek, Ruby and Madison River elk will have to be considered one herd as intermingling occurs and prominent migrations take place.

3. To accomplish desired harvests, seasons will have to be set late and only a portion of the area opened. The accessibility of this range necessitates these restrictions.

#### RECOMMENDATIONS:

1. An either-sex elk season within the Blacktail Creek Drainage for one day, preferably November 15th.

2. Aerial observations be made intermittently from November 1st until migrations have occurred from the Madison River Drainage to Blacktail Creek Drainage.



EAST SIDE MADISON RIVER AERIAL ELK CENSUS

DATE:

March 24, 1951

PERSONNEL:

Charles Manley, Pilot

I. L. Todd, Deputy Game Warden, Ennis

Joe E. Gaab, Biologist

PURPOSE:

To determine the number of elk wintering within this area and to approximate the number of elk that migrated during January from the Gallatin to the Madison.

PROCEDURE:

A 170 Cessna airplane was used and early morning coverage was made.

FINDINGS:

Table No. 1

Location	No. of Elk
Bear Creek to Mill Creek	247
Jourdain Creek	20
Cedar Creek	9
Mill Creek	25
South Indian Creek	42
Wolf Creek	52
Squaw Creek	25
Total	420

CONCLUSIONS:

1. Thirty-seven native elk were counted in the vicinity of Bear Creek last year when it was known that there was not any migration from the Gallatin. It would be reasonable then to conclude that probably 200 to 220 elk migrated in January from the Gallatin into the Madison this winter.

2. From ground observations the only interference with private property to date is the use of some private range. The season has been mild and the elk have not caused damage to haystacks.

RECOMMENDATIONS:

1. The east side of the Madison River to be open to either sex elk during the regular season, October 15 to November 15, 1951.

2. An investigation be made into the possibility and feasibility of an elk range acquisition from Bear Creek to Tollman Creek. Also the necessity for a three and one-half mile elk-proof fence in the same locality to protect private property.



# FIRST FLEECER MOUNTAIN-HIGH RYE AERIAL ELK CENSUS

## DATE:

February 19 and February 23, 1951

## PERSONNEL:

Ray Austin, Pilot

Joe E. Gaab, Biologist

## PURPOSE:

The area shown on the 1950-51 hunter map as area No. 37 was opened last season for the first time to branch antlered bulls from October 15 to October 17, 1950, both dates inclusive. That action was taken following a range inspection ride during April, 1950. This aerial census was made to locate wintering areas and total population.

## PROCEDURE:

The state-owned Piper Super Cub 105 airplane was used to make both flights over the area for a total of three hours and thirty minutes. Two flights were necessary because of air turbulence during the first flight.

## FINDINGS:

1. Table 1 shows the location and number of elk counted.

Table 1.

<u>Location of Elk</u>	<u>No. of Elk</u>
Charcoal Basin	110
Morton Creek	92
Morton Creek	45
German Gulch	7
Lower Beefstraight Creek	4
Beefstraight Creek	10
Beaver Creek	22
Gregson Creek	6
Willow Creek	17
Total Elk	313

2. Twenty-two elk were counted in Cattle and Trusty Gulches west of Vipond Park.

3. Wintering conditions were excellent.

4. Elk were in the vicinity of salt grounds established by the National Forest to obtain distribution.

CONCLUSIONS:

1. This census was not considered too successful as ground and air conditions weren't to the best advantage.
2. Evidence observed from previous inspections and information gained from local laymen indicate that this herd of elk are preyed upon quite heavily by poachers.

RECOMMENDATIONS:

That another aerial coverage be made when better censusing conditions can be had.

SECOND FLEECER MOUNTAIN-HIGH RYE AERIAL ELK CENSUS

DATE:

March 21, 1951

PERSONNEL:

Charles Manley, Pilot, Yellowstone Scenic Airways

Forest Ranger Williams, Deerlodge National Forest

Joe E. Gaab, Biologist

PURPOSE:

This second coverage was made to get a more accurate elk census.

PROCEDURE:

A 170 Cessna plane was used. The Butte Airport was used as a base so that earlier morning coverage could be made. A fresh snow was to advantage.

FINDINGS:

1. Table 1 shows the location of elk and number counted.

Table 1.

<u>Location of Elk</u>	<u>No. of Elk</u>
Willow Creek	71
Horton Creek-High Rye Area	186
Fleecer Mountain Ranger Station	8
Sunday Gulch	25
Charcoal Basin	<u>142</u>
Total Elk Herd	432

2. Jerry Creek was covered during the flight but no elk were observed and no sign indicated that there were elk present.

CONCLUSIONS:

1. This flight proved most successful.

RECOMMENDATIONS:

1. That areas No. 35 and 37 on the 1950-51 hunter map be consolidated into one with the following description: Beginning at the confluence of Jerry Creek with the Bighole River, thence up Jerry Creek, thence up Flume Creek to Burnt Mountain, thence in a westerly and northerly direction along

the Continental Divide to the Mill Creek-Deep Creek road, thence along the Mill Creek road to its junction with Highway 10-A, thence in a southeasterly direction to the junction of Highway 10-A and 10-S to Rocker, Montana, thence south along Highway No. 91 to Divide, Montana, thence in a westerly direction up the Big Hole River to the point of beginning.

2. The above described area open to the harvest of branch antlered bulls from October 15 until the proposed 100 either sex season closes in the Upper Big Hole or to close November 15th.

UPPER BIG HOLE RIVER AERIAL ELK CENSUS

DATE:

March 23, 1951

PERSONNEL:

Charles Manley, Pilot

Bill Schultz, Deputy Game Warden

Joe E. Gaab, Biologist

PURPOSE:

To make complete coverage of the area considered as Big Hole Elk wintering habitat.

PROCEDURE:

A 170 Cessna airplane was used. Break of day coverage after a fresh snow and without turbulence facilitated desired condition.

FINDINGS:

Table 1.

<u>Location of Elk</u>	<u>No. of Elk</u>
Southwest of Divide, Montana	14
Canyon Creek	22
East of Lower Quartz Hill Gulch	59
Warm Spring Creek	27
Steel Creek	7
Squaw Creek	33
Toomey Creek	11
Pony Creek	22
Stanley Creek	7
Bear Creek	6
Bryant Creek	5
Wise River	13
Pintlar Creek	24
Total Elk	250

CONCLUSIONS:

1. The 432 elk counted in the Fleecer Mountain-High Rye plus the 250 counted during this coverage makes up a total of 682 in the Big Hole Elk Herd.

2. To protect antlerless elk from being harvested in excess, the season



must remain early in the Upper Big Hole River where the elk will be dispersed and checking stations can be so placed to most accurately determine the harvest.

3. A continued branch-antlered bull season following an either-sex season is still necessary to drift elk away from unprotected haystacks and alleviate private property damage.

RECOMMENDATIONS:

1. That areas No. 34 and 36 on the 1950-51 hunter map remain the same for the 1951-52 hunting season.

2. That a two-man crew consisting of one Wildlife Restoration Fieldman and one special Deputy Game Warden be equipped with a horse outfit to accomplish a two-fold purpose; namely, additional law enforcement, and the location of elk during the hunting season and the effect of hunter activity on elk migrations.

## RUBY RIVER AERIAL ELK CENSUS

### DATE:

March 20, 1951

### PERSONNEL:

Charles Manley, Pilot

William Dorris, Deputy Game Warden, Twin Bridges

I. L. Todd, Deputy Game Warden, Ennis

Joe E. Gaab, Biologist

### PURPOSE:

To accomplish a complete coverage of the Ruby River Drainage to determine the number of elk wintering there.

### PROCEDURE:

A 170 Cessna airplane was used.

### FINDINGS:

1. Eighty-five elk were counted:

Warm Spring Creek	78
Cottonwood Creek	4
Clovis Gulch	<u>3</u>
Total	85

2. Last year (1950) one hundred and fifty-nine elk were counted within the Ruby River Drainage:

Idaho Creek	12
N. Fork Warm Spring Cr.	2
Middle Fork of Warm	
Spring Creek	15
S. Fork Warm Spring Cr.	8
Short Creek	14
East Cottonwood Creek	22
Tributary Creek	<u>86</u>
Total	159

3. A heavy harvest of these native elk and also on Blacktail Creek elk migrating from the Gravelly range was accomplished during a three-day either-sex season, October 15 through October 17, 1950.

4. Elk were expected on Idaho Creek, but were not observed during this flight.

RECOMMENDATIONS:

1. Closed elk season on the Ruby River Drainage.

## BIG HOLE RIVER AERIAL MOOSE CENSUS

### DATE:

February 19-20, 1951

### PERSONNEL:

Ray Austin, Pilot

Joe E. Gaab, Biologist

### PURPOSE:

Several attempts have been made, from the ground, to census the moose in the Big Hole Basin, an area of roughly 3,000 square miles. For several years haystack damage claims have been sent to the main office. For a number of years there have been special permits on twenty mature bulls. This season has been set conservatively awaiting a census method that would indicate an inventory. On February 1, 1951, a preliminary flight was made to count the moose causing damage at the Tom Schultz Ranch and determine whether or not an aerial census would be feasible. During the investigation it was decided to cover the entire area for the very necessary census.

### PROCEDURE:

1. The areas counted were just the willow bottoms.
2. Narrow sparse bottoms were flown at about 200 feet until either a moose was spotted or sign was observed. That immediate area was then flown at just above willow height and then back at about 200 feet again. Moose, particularly calves, lying down under brush were spooked up and on their feet and easily counted.
3. Narrow dense bottoms were flown at just above willow height and back at about 200 feet.
4. All wide willow bottoms were flown about 50 feet above the willows in strips of about 200 yards.
5. The state-owned Piper Super Cub 105 was flown a total of eight hours.

### FINDINGS:

1. Two hundred and sixteen moose were counted within the Big Hole River Drainage above the confluence of the Wise River.
2. Sexing at this time of year is impossible; however, if it is found later that the moose move into the willow bottoms when the males still have their antlers, sexing could be accomplished.
3. By spending more time to determine calves, the herd's annual increase

could be determined.

4. Observers felt that two-thirds of the moose were inhabiting the willow bottoms. The remaining population being at higher elevations in isolated areas of alpine fir and Engelmann spruce.

#### CONCLUSIONS:

1. This method of counting proved very satisfactory in this area. A definite trend year after year can be established by using this method if two-thirds of the total population is used consistently and the number of special mature bull permits remain constant in the same defined area.

2. The total moose population for the entire Big Hole River Drainage above the confluence of Wise River is about three hundred and twenty-four.

3. Using an annual increase of 20 per cent the herd will reproduce 32 males each year.

4. If the herd is to be kept static a harvest of 20 bulls should hold the population constant. Leaving 12 males out of each year's calf crop should provide adequate breeding stock.

#### RECOMMENDATIONS:

1. A future moose harvest of 20 mature bulls in the same defined area as the 1950 season.

2. An annual census be made by the same method until sex ratio and annual increase figures are established.

3. To relieve damage to haystacks, a program at building permanent panels for ranchers that receive damage would perpetuate a herd of three hundred and fifty to four hundred moose. Three years' fencing of ten haystacks would practically solve all interference.



SCUDDER CREEK MULE DEER RANGE INVESTIGATION

DATE:

February 20, 1951 - March 17, 1951

PERSONNEL:

Ray Austin, Pilot

Orville Lewis, Deputy Game Warden, Dillon

J. E. Gaab, Biologist

PURPOSE:

Previous investigations have indicated that there would be excessive forage use if deer persistently concentrated in this relatively small area. These investigations were made to determine the distribution of deer this winter.

LOCATION:

Scudder Creek is a tributary to Grasshopper Creek, North of Bannack, Montana in Beaverhead County.

PROCEDURE:

An aerial inspection was made February 20, incidental to the Big Hole moose survey, to determine the concentration at that time. On March 17 an inspection was made on foot to estimate the deer population and to determine forage utilization.

FINDINGS:

A. February 20, 1951

1. The aerial inspection easily gave the observers an indication of a heavy concentration of deer and that a ground inspection was necessary.

B. March 17, 1951

1. Four hundred deer is a conservative estimate of the number of deer in the critical area.

2. Utilization on the two predominant forage species, namely: Mountain mahogany (Cercocarpus parvitolius) and juniper (Juniperus scopulorum) is excessive.

3. Condition of the deer is poor. With few exceptions all of the deer appear emaciated and have dull pelage. Selection of food is limited. Domestic sheep use the area in early spring and late fall,

therefore competition is expected. A quite heavy loss of deer can be expected this spring unless most favorable weather conditions are had.

#### CONCLUSIONS:

1. Recommendations for a reduction of either sex of deer was not made last year due to lack of information concerning the distribution of the deer into adjacent areas when the forage became low. The present winter is open in this area and the mobility of the deer is not restricted. Although a very high per cent of available forage has been taken, the deer do not move into the adjacent areas.

2. Without having made observations in the area at the time when domestic sheep are ranging there, little should be said about the competition between winter deer use and early spring and late fall domestic sheep use. However, before a clear picture of forage utilization can be made, further investigations will be necessary.

3. Range use is excessive and heavy winter losses of deer are contemplated. Therefore the following recommendations are necessary.

#### RECOMMENDATIONS:

1. Following the regular 1951 deer season an either-sex season to harvest an additional two hundred deer is recommended. To the best advantage, that can be most effectively accomplished by issuing weekly 50 special permits valid for one week, and continuing for four weeks, between Farley and Dyce Creeks.

2. Investigations should be made when the domestic sheep are ranging in the area.

3. Weights and measurements should be made and lower jaws collected during the special season for comparative information with those made and collected from herds in different environments.

MacKAY RANCH MULE DEER CENSUS

DATE:

February 12, 1951

AREA:

Described as MacKay Ranch special antlerless deer season (1950) between the East and West Rosebud Rivers in Stillwater and Carbon Counties.

PURPOSE:

To determine total deer population and haystack damage.

PROCEDURE:

A 140-Cessna airplane was chartered at Livingston, Montana. Total flight time was two hours. Ideal conditions were advantageous, fresh snow and no wind. Deer in cover were flushed and counted.

FINDINGS:

1. Three hundred and thirty-six deer were counted.
2. Some damage on one haystack.
3. Two golden eagles seen on deer carcasses.
4. Ranch personnel have counted eight dead deer lost as cripples since the 1950 hunt.
5. Wintering conditions were excellent.
6. Some buck deer seen with antlers.



## RUBY RIVER MULE DEER INVESTIGATION

### DATE:

March 20 - 26, 1951

### PERSONNEL:

Frank Gummer, Field Assistant

Maurice Wesen, Field Assistant

Jim Reed, Field Assistant

Norman Wortman, Field Assistant

William Dorris, Deputy Game Warden

Joe E. Gaab, Biologist

### PURPOSE:

The last census of mule deer in this area was made in March of 1949. During the winter of 1949-1950 counting conditions were not favorable. After continuous either-sex seasons a count was necessary to determine the trend in the total population.

### PROCEDURE:

The concentration area has been broken into five units and these units counted consistently in the same manner. Men on foot flushing and sweeping each unit in the later hours of daylight being careful not to duplicate any animals to acquire a total census of the unit was the manner in which this count was conducted. The Vigilante Ranger Station was used as a headquarters during this inspection.

### FINDINGS:

Table 1. Mule deer census.

	Mature	Fawns	Unclassified	Total
Unit No. 1	5	2	48	55
Unit No. 2	116	50	260	426
Unit No. 3	150	60	318	528
Unit No. 4	39	16	119	174
Unit No. 5	73	40	174	287
Total	383	168	919	1470



Table 2. Mule deer census (March, 1949)

Unit No.	Number Counted
1	47
2	350
3	1550
4	32
5	280
Total	2,259

Table 3.

Year of Mule Deer Census	No. Counted
1947	1724
1948	2104
1949	2259
1950	--
1951	1470

Table 4.

Total Harvest in 1948	653
Total Harvest in 1949	582
Total Harvest in 1950	566

1. Table No. 1 and 2 indicate that sample counting must include quite a large territory to locate shifting concentrations.

2. The population trend is toward reduction.

3. Counting conditions were not most desirable, however adequate. Coverage was made by extending the upper limits of each unit to include all of the area inhabited by the deer.

4. Browse use throughout these units has been excessive in past years and still is, in some areas. Two mild winters plus a reduction in the deer population has reduced over-grazing in some areas. The general browse utilization picture, however, is still to excess and would be much more so in a tough winter.

5. Four deer carcasses were observed, the kills attributed to coyotes. One animal harbored an excessive number of larvae of the deer nose botfly.

6. Three buck deer were observed still carrying antlers.

### CONCLUSIONS:

1. The either-sex seasons in the past are having effect in reducing populations and lessening forage utilization.

2. A speedier reduction in population would be desirable. Weather conditions allowed only 376 antlerless deer to be harvested when 500 were to be allowed during a month's open season, October 15 through November 15, last year. The summer dispersal of deer is quite extensive and during open falls such as last year's, only the most ardent hunters are successful, such as it should be. During an average season a reduction of 500 antlerless deer could probably be had without extending the time.

3. At present the competition between domestic stock, primarily sheep, and deer has not been determined on this range. To properly administer this range, this information would be of pertinent value.

### RECOMMENDATIONS:

That 500 antlerless deer be harvested during the 1951 hunting season in addition to the antlered deer taken during the regular season, October 15 through November 15, in the same described area as indicated on the 1950-51 hunter map as Area No. 3, Madison County.

That browse utilization studies be made to determine competition between domestic sheep and mule deer.



STATE Montana  
PROJECT 38-R  
DATE April 15, 1951

ABSTRACT

Upland Game Bird Survey and Investigation

1. Pheasant aging and hatching date studies.

On the opening day of the 1950 pheasant season, the Flathead checking station intercepted 1,530 cocks of which a semi-selective sample of 167 birds were aged by using the Kimball age gauge method and the depth of the bursa of Fabricius. The age gauge was 94 per cent accurate with the greatest error found in aging adult and large immature birds. Nine hundred and sixty-seven immature cocks from the Flathead Valley, 78 from the Bitterroot Valley and 76 from the Fairfield Bench were aged to the nearest week by primary wing feather development, indicating that the peak of the hatch occurred in mid-June in the Flathead and Bitterroot Valleys, and in early July in the Fairfield Bench area with some late hatching occurring in August and September. Ninety-five known age Flathead Valley juveniles weighed an average of 2.53 pounds; most birds over 15 weeks had gained the bulk of their expected body weight.

2. Survival study of game farm pheasants.

Nine hundred and ninety-five game farm cock pheasants of four age classes were banded, weighed and released in typical Bitterroot Valley pheasant habitat. To date 286, or approximately 29 per cent of these birds have been accounted for: Ninety were found dead prior to the hunting season; 179 were shot by hunters; and 17 were live-trapped after January 1, 1951. Recommendations are: No releases of less than 10-week old pheasants; presence of disease in game farm birds should be determined prior to release and sick or weak birds should not be released among wild populations; vegetative cover should be provided in game farm pens and runways; and future studies should be conducted in areas where more rigid contacts can be exerted.





STATE Montana  
PROJECT 38-R  
DATE April 15, 1950

QUARTERLY PROGRESS REPORT

For

SURVEYS AND INVESTIGATIONS

As Required By

FEDERAL AID IN WILDLIFE RESTORATION ACT

1. Title of Project: Upland Game Bird Survey and Investigation
2. Project Personnel: Wm. R. Bergeson, Game Bird Biologist  
Robert J. Greene, Assistant Game Bird Biologist  
Fred L. Hartkorn, Field Biologist
3. Report of Progress:

Survival of Game Farm Pheasants Released in the  
Bitterroot Valley

DATE:

January, February, and March, 1951

INTRODUCTION AND PAST PROGRESS:

The chief purpose of this project is to determine optimum age at which game farm pheasants may be released for maximum survival. Nine hundred ninety-five game farm cock pheasants of four age classes were banded, weighed and released simultaneously in typical pheasant habitat in the Bitterroot Valley. By November 5, a total of 90 had been found dead mainly in the youngest age and lightest weight groups. By January 1, 1951 a total of 123 bands had been returned by hunters. The older, heavier birds were bagged in largest proportions. Details of this aspect of the study were reported in the Montana Quarterly Reports of July - September and October - December, 1950. (Also note Tables 1, 2 and 3).

QUARTERLY PROGRESS:

### Procedure:

Pheasants were live-trapped whenever adverse weather made trapping profitable, which was limited to 12 days. Portable steel frame 4' x 4' x 2' traps were used with barley as bait.

### Results:

A total of 91 pheasants were trapped within a three-mile radius of the point of release. Of these, 54 were hens, 20 unbanded cocks and 17 banded cocks. Of the banded birds, 4 were from the 12-week old group, 8 from the 11-week group, 5 from the 9-week old group and none from the 8-week old group. By weight classes, 7 per cent of the 28-36 oz. group were trapped, 4 per cent of the 23-27 oz. group, 1 per cent of the 18-22 oz. group, 1 bird in the 13-17 oz. class and no birds from the 6-12 oz. class. (Note Tables 1 and 2).

Farm operators in the vicinity report seeing about the same number of cock pheasants this winter as they noted the past several winters, which indicates there are probably not many of the cocks released in that area still present. This was substantiated by the fact that more wild cocks than banded cocks were caught in the area.

During January, 16 additional bands were recovered from hunters who reported bagging the birds during the season in November, but forgot to mail them in sooner. These band numbers are included in the birds shot column of Tables 1 and 2.

### DISCUSSION AND PRESENT CONCLUSIONS:

In light of the fact that the primary purpose of this study was to provide information regarding game farm birds that would increase the efficiency and general value of the game farm program, let us appraise present findings with a view toward possible application in the 1951 season.

Although it would be desirable to have accounted for a larger per cent of the birds released, the data we do have represent a good sample of each group as shown in Table 1, columns 9 and 10 which shows that 30 per cent of two age groups and 28 per cent of the other two age groups are accounted for.

Based on present data it indicated that birds in the youngest age class, 8-week old birds, and lightest weight class, 6-12 oz., survived in lowest proportion of the birds released, as these groups were found dead in greatest percentage, and recovered by hunters and live-trapping in lowest percentage of all groups (Note Tables 1 and 2).

By age class, 20 per cent of the 8-week olds were found dead, compared to only 6 per cent of the 9-week olds, and 5 per cent for each of the 11 and 12-week groups. By weight class, 23 per cent of the 6-12 oz. class were found dead compared with 12 per cent of the 13-17 oz. class, and 6, 4, and 2 per cent respectively for the 18-22, 23-27, and 28-36 oz. classes. On the other hand, only 9 per cent of the 8-week class were reported shot and none were trapped, while 19 per cent of the 9-week, and 22 per cent of each of the 11 and 12-week groups were reported shot. Also, 2 per cent of the 9-week

class, 2 per cent of the 11-week class and 3 per cent of the 12-week class were live-trapped. The same trend was observed by weight groups.

Inversely, findings to date indicate that the older, 11 and 12 -week, or heavier, 23-36 oz., classes of birds survived in greatest proportion, as a lower percentage of these weight and age classes was found dead and a higher percentage was reported shot or live-trapped than the younger, lighter classes. Note Tables 1 and 2. Considering birds reported shot and live-trapped as surviving to the opening of the hunting season, it is indicated that in proportion to weight groups, at least 7 per cent of the 6-12 oz. group survived, 15 per cent of the 13-17 oz. group, 23 per cent of the 18-22 oz. group, and 27 per cent of each of the 23-27 and 28-36 oz. groups survived.

Part of the 8-week old class, 136 birds, were from pens with dense cover and part, 114 birds, were from pens with little or no cover. The birds from pens with dense cover apparently survived better than birds from pens with a lack of cover. Only 12 per cent of the birds from pens with cover were found dead compared to 30 per cent of those from pens lacking cover. Hunters reported shooting 11 per cent of the birds from cover and 7 per cent from pens without cover.

Dead pheasants found were autopsied and some were found to have ulcerative enteritis, others were anemic, and some showed lack of vitamin A in the diet by excess urate deposits in the kidneys. In that ulcerative enteritis is a communicable disease, it would seem wise to stop releasing birds with this disease to keep it from spreading to the wild pheasant population and dead birds found at the game farms should be autopsied to determine presence of disease.

To date, 29 per cent of the released birds have been accounted for. Where are or what happened to the other 71 per cent? Based on several instances where people living near the release site reported that their dogs had brought home dead banded pheasants from which the bands were lost subsequently, it would seem reasonable to assume that many pheasants died that were not found or reported found. Probably illegal kill accounted for a few. It is doubtful that all hunters who bagged banded pheasants turned in the bands. Some banded cocks are still alive as evidenced by trapping returns; however, in past studies less than one per cent of the banded birds were reported killed by hunters the second hunting season after release.

#### SUMMARY:

A total of 995 male pheasants of four age groups were banded, weighed, and released in typical pheasant habitat in the Bitterroot Valley on August 25, 1950, in an effort to determine optimum age for release of game farm pheasants.

The birds were under observation in the field the month following release and occasional observation thereafter. From time of release to the opening of the hunting season, 90 of the banded birds were found dead, of which most were from the youngest and lightest groups. Details of this phase of the study were reported in Montana's P-R Quarterly for the period July - September and October - December.



To date, 179 banded birds have been reported shot. By age class the 11 and 12-week old birds were recovered in greatest number; 22 per cent of these two groups being reported shot, compared to 19 per cent of the 9-week old group and 9 per cent of the 8-week old class. By weight, 21 per cent of the 28-36 oz. group, 23 per cent of the 23-27 oz. group, 21 per cent of the 18-22 oz. group, 14 per cent of the 13-17 oz. group, and 7 per cent of the 6-12 oz. group have been reported shot.

A total of 91 pheasants were trapped near the release site of which 17 were banded cocks. By age, 5 of these cocks were 9 weeks old, 8 were 11 weeks old, and 4 were 12 weeks old at time of release. They had all weighed over 16 oz. at time of release. None of the 8-week old birds or birds from the lightest weight class were recovered.

To date, 286 or approximately 29 per cent of the released birds have been accounted for; 90 were found dead, 179 were reported shot, and 17 were live-trapped after January 1st.

Future plans are to make occasional field checks of release area and check hunters in that area during the 1951 pheasant season in an effort to account for more of the banded cocks.

#### RECOMMENDATIONS:

Based on findings to date, it is recommended that:

1. Game farm pheasants be held until at least 10 weeks of age to obtain best survival.
2. Sick or weak appearing birds should not be released in order to minimize the possibility of spreading disease to wild pheasant populations; further, an effort should be made to determine presence of diseases in game farm birds prior to release.
3. Vegetative cover be provided in holding pens and runways at the game farms.
4. Future projects of this type should be conducted in an area where more positive control over hunters and hunting is possible in order to insure maximum return of bands.

Submitted by:

Fred L. Hartkorn, Field Biologist  
Wildlife Restoration Division

March 23, 1951

Table 1. Recovery of hatchery-raised pheasants released in the Bitterroot Valley by age class.

Age Class	Number Birds in Class	Number Found Dead	% Found Dead	No. Shot	% Shot	Number Trapped	% Trapped	Total Acctd For	% Acctd For
8 weeks	250	51	20	23	9	0	0	74	30
9 weeks	249	16	6	47	19	5	2	68	28
11 weeks	374	17	5	82	22	8	2	107	28
12 weeks	122	6	5	27	22	4	3	37	30
Totals	995	90	9	179	18	17	2	286	29

Table 2. Recovery of hatchery-raised pheasants released in the Bitterroot Valley by weight class.

Weight Class	No. in Class	No. Found Dead	% Found Dead	No. Shot	% Shot	No. Trapped	% Trapped	No. Shot or Trapped	% Shot or Trapped
6-12 oz.	118	27	23	8	7	0	0	8	7
13-17 oz.	311	36	12	46	14	1	0	47	15
18-22 oz.	299	18	6	64	21	4	1	68	23
23-27 oz.	209	8	4	49	23	8	4	57	27
28-36 oz.	58	1	2	12	21	4	7	16	27
Totals	995	90	9	179	18	17	2	196	20

Table 3. Recovery of pheasants of the same age group but from pens with cover and pens without cover--8-week group.

<p>136 released from pens with dense cover</p> <p>17 found dead 12% found dead</p> <p>15 shot 11% shot</p>	<p>114 released from pens with little or no cover</p> <p>34 found dead 30% found dead</p> <p>8 shot 7% shot</p>
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## 1950 PHEASANT HARVEST FINDINGS

### DATE:

November 5 to 12, 1950

### PERSONNEL:

E. L. Cheatum, Leader, Montana Coop. Wildlife Research Unit  
P. L. Wright, Asst. Leader, Montana Coop. Wildlife Research Unit  
Wm. R. Bergeson, Game Bird Biologist  
Robert Greene, Assistant Game Bird Biologist  
Gerald Salinas, Assistant Waterfowl Biologist  
Fred Hartkorn, Field Biologist  
John Dudiack, Student, Montana State University

### PURPOSE:

1. To determine the accuracy of the Kimball-ring spur length method of aging pheasants during the hunting season in Montana.
2. To determine the hatching dates of young pheasants in the hunter's bag.

### PROCEDURE:

Pheasant hunter bags were checked at voluntary checking stations located on the principal roads leading out of the main hunting areas.

Birds were aged by the Kimball spur gauge method, 25/32-inch diameter metal ring with a slot cut out to slip over the leg of the bird being studied. If the ring could be passed over the leg and spur when held with the slot at right angles to the spur, the bird would be considered immature--a bird hatched in 1950. If the ring would not pass over the leg and spur when tested as above, the bird would be considered an adult--hatched before 1950. As a check on this method of aging, Dr. E. L. Cheatum and Dr. P. L. Wright, staff members of the Cooperative Wildlife Research Unit at Montana State University, checked 167 birds at the Flathead checking station on November 5, 1950, using both the Kimball ring method and the depth of the bursa of Fabricius to determine the age of each bird.

To determine hatching dates of immature cocks checked, the outer sheathed primary wing feather was measured and the feather length table published by the South Dakota Game Department was used to obtain the age in weeks of each bird.

Ninety-five immature birds that had been aged by wing feather development were carefully weighed at the Flathead checking station on November 5, 1950.

#### FINDINGS AND DISCUSSION:

##### Age by Spur Length:

One of the 167 birds aged by both spur lengths and depth of the bursa of Fabricius, 121 were considered immature and 46 adults, using the Kimball ring to gauge spur lengths, and based on depth of the bursa 128 were considered immature and 39 adult. Of the 121 birds aged as immature by the spur length method, 120 were found to be immature and 1 adult based on depth of the bursa. Of the 46 birds aged as adult by use of the spur gauge, 38 were considered adult and 8 immature by depth of bursa. An effort was made to examine by both methods all adult and extra large immature birds, but due to excessive numbers of hunters checked it was not possible to accomplish this to a large degree. However, the 167 birds checked are considered to be a semi-selective sample of the 1,530 cocks checked at the Flathead checking station the opening day (Note Table 1).

Based on this 167 bird sample, where 9 errors were found in age of birds based on the spur length in relation to the Kimball ring as checked by the depth of the bursa of Fabricius, it is indicated that the Kimball ring method is 94 per cent accurate when applied to Flathead Valley pheasants. Greatest error would come in aging the adult and large immature birds where 8 of the 46 birds indicated to be adult by use of the Kimball gauge were found to be immature upon examination of the bursa. This would account for a 17 per cent error in birds judged to be adult. An error of less than one per cent was noted in the birds considered immature by the Kimball age gauge since one of the 121 birds aged as immature by the age gauge was found to be adult by bursa examination. The significance of this error is shown when we consider the adult-immature ratio of pheasants checked out of the Flathead Valley during the 1950 season, since a ratio of 5.5 immature birds per adult was observed using the spur length age gauge, but when adjustments for error were made, this ratio would be 6.6 immature cocks per adult.

##### Determination of Hatching Dates:

In the Flathead Valley a total of 967 immature birds were further aged by primary wing feather development. (Note Table 2). Based on these birds it is indicated that the peak of the hatching in 1950 in this area took place in mid-June. Fifty-nine per cent of the birds were hatched in June, 35 per cent in July, 6 per cent in August, and <1 per cent in September.

In the Bitterroot Valley a total of 78 immature cocks were aged by primary wing feather development (note Table 3). Based on the age of these birds it is indicated that the peak of the hatch occurred in mid-June also and that 69 per cent of the birds were hatched before July 1, 28 per cent hatched in July, and 3 per cent hatched in August.

On the Fairfield Bench only first primary wing feathers were collected with a result that birds younger than 18 weeks could not be aged (note Table

4). Based on these birds it is indicated that 51 per cent had hatched by July 1 and 49 per cent hatched after that date with the peak of the hatch probably occurring in early July.

It was the opinion of many game workers that the pheasant hatch was very late in 1950 and based on the age of road kills and birds caught in the fields, it was indicated that approximately 50 per cent of the birds would not be old enough to be "colored up" so as to distinguish males from females by the opening of the hunting season. Therefore, it is the opinion of this observer that true indication of hatching dates for 1950 is not given by the young cocks checked in hunters' bags because many of the youngest cocks encountered in the field were passed by as hens by the hunters. Another suggested possibility for the absence of very young birds in the hunters' bag is that they were too young to survive early snowy cold weather which occurred for a few days in both September and October and had perished before the hunting season.

#### Weights:

A total of 95 immature cocks were weighed and their exact age determined. (Note Table 5). Based on these birds it would seem that the immature cocks have gained most of their body weight by the time they are 15 weeks old. The average weight of these birds was found to be 2.53 pounds with considerable range in weights in each age class, indicating that individual birds of even the same brood might differ in rate of maturity. Past studies have shown the average adult cock to weigh about three pounds and the average immature cock 2.75 pounds at the time of the hunting season in this area.

#### SUMMARY AND CONCLUSIONS:

Of a total of 167 pheasants aged both by means of the spur length age gauge and depth of the bursa of Fabricius, nine birds were found to be incorrectly aged by the spur length, assuming depth of bursa provided correct age. Eight of 46 birds aged as adult by spur gauge were found to be immature based on bursa depth. One of 121 birds aged as immature was considered an adult based on bursa depth (Note Table 1).

Based on these findings it is indicated that the 25/32 inch diameter gauge used at present to age pheasants by spur length is only 94 per cent accurate with a trend to class some immature birds as adult and an occasional adult as an immature.

Using primary wing feather development to further age the juvenile cocks to weeks of age, it is indicated that: (1) The peak of the 1950 hatch occurred in mid-June in the Flathead and Bitterroot Valleys and in early July in the Fairfield Bench area, (2) Some late hatching occurred in August and September. (Note Tables 2, 3, and 4).

Based on frequent observations in late August and September of road killed juveniles and broods that were only two to three weeks old, it is the opinion of this observer that a true indication of hatching dates is not given by the juvenile birds checked in the hunters' bag. This could be accounted for by: (1) Very young cocks not being "colored up" sufficiently for the hunter



to identify them as cocks and thus pass them up as hens since hunting was limited to cocks, or (2) many very late hatched birds perished during cold snowy weather in September and October and prior to the season.

A total of ninety-five known age juvenile cocks were weighed and it was found that most birds over 15 weeks old had gained most of their expected body weight. The average weight of these birds was 2.53 pounds. (Note Table 5).

#### RECOMMENDATIONS:-

Further accuracy checks of the spur length age gauge should be made in other pheasant producing areas of Montana as well as the Flathead Valley. Possibilities of modifying the present age gauge diameter to obtain greater accuracy in aging Montana pheasants should be investigated.

Juvenile pheasants in the hunters' bag should be further aged in future years to: (1) Gain comparative information regarding the early pheasant hatch, (2) provide a check for other nesting studies carried on during the spring and summer season, and (3) provide reference information if studies to determine minimum breeding age are conducted as anticipated.

Submitted by:

Fred L. Hartkorn, Field Biologist  
Wildlife Restoration Division

March 22, 1951

Table 1. Pheasants aged by spur length and Bursa of Fabricius depth.

<u>Age Based on Kimball Spur Length Gauge</u>	<u>Age Based on Bursa Depth</u>
46 Adults	38 Adult, 8 Immature
121 Immature	120 Immature, 1 Adult

Table 2. Age of juvenile pheasants taken November 5, 1950, in Flathead Valley.

<u>Age in Weeks</u>	<u>Number</u>	<u>Approximate Hatching Date (Week Ending)</u>	<u>Percentage Hatched per Weekly Period</u>
22	128	June 10	13
21	170	June 17	18
20	151	June 29	16
19	119	July 1	12
			} 59% Hatched in June
18	136	July 8	14
17	65	July 15	7
16	89	July 22	9
15	51	July 29	5
			} 35% Hatched in July
14	45	Aug. 5	5
13	10	Aug. 12	1
12	1	Aug. 19	0
11	1	Aug. 26	0
			} 6% Hatched in Aug.
10	1	Sept. 2	0
			<1% Hatched in Sept.
Total	967		100



Table 3. Age of juvenile pheasants taken November 5, 1950, in Bitterroot Valley.

Age in Weeks	Number	Approximate Hatching Date (Week Ending)	Percentage Hatched per Weekly Period	
23	3	June 3	4	69% Hatched in June
22	15	June 10	18	
21	20	June 17	26	
20	5	June 29	6	
19	12	July 1	15	
18	10	July 8	12	28% Hatched in July
17	5	July 15	7	
16	2	July 22	3	
15	4	July 29	6	
14	2	Aug. 5	3	3% Hatched in August
	78		100	

Table 4. Age of juvenile pheasants taken November 5, 1950, on Fairfield Bench.

Age in Weeks	Number	Approximate Hatching Date (Week Ending)	Percentage Hatched per Weekly Period	
23	2	June 3	3	51% Hatched in June
22	7	June 10	9	
21	9	June 17	12	
20	9	June 24	12	
19	11	July 1	15	
18	11	July 8	15	49% after July 1
-18	26	After July 9	34	
	75		100	

Table 5. Immature cock pheasant weights.

Age	Number Weighed	Average Weight
14	3	2.04
15	3	2.61
16	4	2.46
17	8	2.46
18	17	2.47
19	13	2.59
20	12	2.61
21	24	2.56
22	11	2.61
	95	2.53

STATE Montana  
PROJECT 39-R  
DATE April 15, 1951

ABSTRACT

Waterfowl Surveys and Investigations

Waterfowl Season

1. A split season totaling 36 days was chosen by the Montana Fish and Game Commission for 1950.
2. The regular voluntary checking stations were again operated.
3. There was a decrease in hunters checked and also the duck stamp sales in 1950.
4. The average number of birds bagged per day per hunter increased in 1950.
5. Species composition remained essentially the same during three years of comparable bag checks.
6. The average number of days in the field, during the first half of the season for each hunter, decreased in 1950.
7. The total bag of birds during the first half of the 1950 season decreased from the 1949 total.
8. There were fewer juvenile mallards in the bag in 1950 than in 1949.

Waterfowl Banding

1. One hundred and eighty-three mallards were banded with Federal Fish and Wildlife Service bands from January 19 to March 10, 1951. No other species of waterfowl were caught in the trap.
2. Five mallards, representing 6.8 per cent of the ducks banded at the same location in 1950, were trapped again in 1951. Two mallard drakes that had been banded in March 1949, at Toston, were retrapped during this operation.
3. Thirty-eight individuals were retrapped a total of 78 times. Forty-seven per cent of the retrapped ducks repeated twice or more.
4. One hundred and ninety-seven plastic tags were attached to mallards during the two-month period.

5. The marking experiments utilized four types of plastic tag material. They were: Window drapes, "koroseal" and two types of table covering material.

6. From the returns on 32 per cent of the tags, 20.6 per cent of the ducks had retained their tags for one or more weeks.

7. Only one tag, a Type D, remained on at the end of three weeks.

8. Types A and C did not remain attached for even one day on the ducks retrapped.

9. The 22mm skin clips were apparently too small to hold the tags securely.

10. Four lost tags were found in the area within 300 yards of the trap.

11. Three tagged ducks were identified during field observations.

12. The tags could be identified at 300 yards with 8-power glasses or at 75 yards with the unaided eye.

13. The sex ratio of all ducks banded was 300 males to 100 females. The sex ratio of retrapped ducks was 510 males to 100 females.

14. There were considerable more drakes banded the last half of the project than the first half.

STATE Montana  
PROJECT 39-R  
DATE April 15, 1951

QUARTERLY PROGRESS REPORT

For

SURVEYS AND INVESTIGATIONS

As Required By

FEDERAL AID IN WILDLIFE RESTORATION ACT

1. Title of Project: Waterfowl Surveys and Investigations
2. Project Personnel: Wynn G. Freeman, Waterfowl Biologist  
Gerald Salinas, Assistant Waterfowl Biologist
3. Report of Progress:

The 1950 Waterfowl Harvest in Montana

A split season totaling 36 days was chosen by the Fish and Game Commission as the 1950 waterfowl hunting season in Montana. The first period began on October 6 and the second period began on November 17. This season provided the same number of days for hunting as did the 1949 waterfowl season.

The regular voluntary checking stations were again operated in the same locations and during the same days of the week. These stations have been run for three years and are providing good information on the hunting trend. Postal cards, personal interviews, and additional hunter checks were also used to better determine hunter success.

The number of hunters checked through our voluntary checking stations during the 1950 hunting season was 1,909. This was a decrease of 274 from the number of hunters checked in 1949. The state-wide sale of duck stamps also showed a decrease from 32,117 in 1949 to 30,858 in 1950.

The average number of birds taken per trip to the field increased from 1.4 in 1949 to 1.9 in 1950 (Table 1). This increase was a general increase throughout the season with the most improvement occurring during the second half. During the first half of the season, two checking stations showed a minor decrease of one-tenth bird per hunter per day (Table 1).



The Great Falls checking station (Table 2) showed considerable increase in birds bagged per trip to the field during both halves of the split season. The 1950 season was considered the best of the three seasons on which we have comparable data. The storms which occurred during the closing days of the first half of the season and throughout the second half of the season drove most of the birds south. However, in compensation, the storms concentrated the remaining birds and this resulted in excellent shooting.

The species composition at Great Falls remained unchanged with mallards again contributing the greater portion of the bag. During the second half of the season, mallards made up 97.4 per cent of the total bag. From the number of band returns, it was determined that we were shooting the resident winter population. The species again making up the bulk of the bag were mallards, pintails, baldpates, gadwalls, shovellers, and green-winged teal.

The Flathead checking station (Table 3) also showed an increase in the number of birds per trip to the field during both halves of the split season. The 1950 season in this area was considered the best of the three seasons on which we have comparable data. The species composition of the bag remained unchanged with mallards, baldpates, green-winged teal, and pintails making up the bulk of the bag. However, the usual percentage of the bag contributed by baldpates and green-winged teal was made during the first half of the season instead of the usual distribution through both halves (Table 3). The inclement weather drove all but the most hardy birds south at the close of the first half of the hunting season.

The Bitterroot checking station (Table 4) shows more consistency than any of the checking stations in the average number of birds per trip to the field. There was, however, an increase in hunter success in 1950 which was attributed entirely to the second half of the season. The warm water areas in the Bitterroot Valley provide an ideal situation for the concentration of birds when inclement weather freezes other resting areas. The species composition of the bag remained unchanged with mallards, green-winged teal, baldpates, and wood ducks making up the greater portion. Mallards again contributed over 90 per cent of the total bag during the second period.

The combined information from all checking stations indicates that the number of birds per trip to the field has risen from 1.29 birds in 1948 to 1.91 birds per day in 1950 (Table 5). Although this system of checking stations does not give complete information on the state-wide kill, enough land area or habitat type is sampled to provide reliable trend information.

There has been considerable variation within the parts of the season as to how much of the bag was contributed by an individual species. However, year to year comparisons of the combined total contribution of individual species varies only slightly (Figure 1). This poses the probability that when these data have been gathered for several hunting seasons, the species composition of the bag will be known, within specified percentage limits, and yearly bag checks of these areas for species composition will not be required.

The pheasant season, which was opened between the two halves of the waterfowl season, again afforded an excellent opportunity to obtain information concerning the first half of the waterfowl season. The questions asked of the



pheasant hunters were as follows: 1. Did you buy a duck stamp? 2. Did you hunt ducks or geese during the first half of the season? 3. How many ducks did you bag? 4. How many times did you go hunting? A comparison of these data with similar data taken in 1949 (Table 6) shows that although the number of birds taken per day increased, the average number of days in the field and consequently the total bag for the first half of the 1950 season was reduced. The gathering of information pertaining to the average number of trips to the field during the second half of the season has not been completed.

Sex and age ratios on mallards were gathered during the first half of the season (Table 7) and sex ratios were gathered during the second period. The sex ratio increased from a 1:1 ratio during the first half of the season to a ratio of two males to one female during the second period. In all cases, the ratios indicated fewer juveniles in the bag in 1950 than were in 1949.

The U. S. Fish and Wildlife Service conducted a postal card survey of waterfowl hunting in Montana for information on the 1950 hunting season. The results of this survey showed a similar, but exaggerated, picture to that obtained from the checking stations.

There was a 59.5 per cent return on the cards sent out to the hunters. The number of days the hunter went to the field was calculated as 5.9 for the season. The number of birds bagged per hunter was 12.8 for the season and the number of birds bagged per day was 2.2. The postal card information indicated a larger kill than was indicated by actual bag checks. However, Nelson in Utah, has demonstrated that the exaggeration that is apparent in a postal card sample seems to be consistent year after year and the information gained can be utilized in following trends.

Table 1. Hunter information obtained from voluntary checking stations in Montana during the 1950 waterfowl hunting season.

	No. of Hunters		Birds Bagged		Birds Per Hunter			
	1st Half	2nd Half	1st Half	2nd Half				
	1950	1950	1950	1950				
	Season	Season	Season	Season	1949	1950	1949	1950
Great Falls	418	257	887	547	1.3	2.1	1.3	2.1
Flathead	353	240	670	476	1.8	1.9	1.0	2.0
Bitterroot	299	205	378	430	1.3	1.2	1.3	2.1
Blackfoot	137		247		1.9	1.8	1.9	1.8
Total	1207	702	2182	1453	1.5	1.8	1.2	2.1
							1.4	1.9
		1909	3635					

Table 2. Yearly comparisons by percentage of the data obtained at the Great Falls voluntary checking stations.

	1st Half of Season			2nd Half of Season			Total for Season		
	1948	1949	1950	1948	1949	1950	1948	1949	1950
Mallard	68.2	59.1	56.4	85.8	77.2	97.4	69.7	62.2	72.1
Gadwall	1.1	3.8	6.8	-	1.7	0.5	1.0	3.3	4.4
Baldpate	5.1	4.8	8.9	1.6	3.3	-	4.8	4.5	5.5
Pintail	7.4	11.3	8.3	3.2	2.2	0.7	7.0	9.5	5.4
G. W. Teal	3.9	6.9	4.9	1.6	0.6	0.3	3.8	5.6	3.2
B. W. Teal	1.7	2.5	2.2	-	-	-	1.6	2.0	1.3
Shovellers	4.1	3.9	6.0	6.4	5.0	0.1	4.3	4.0	3.8
Redhead	0.9	2.1	0.9	-	0.6	0.1	0.9	1.8	0.6
Ring-necked	-	-	-	-	-	-	-	-	-
Canvas-back	1.7	0.8	0.5	1.6	1.1	-	1.7	0.8	0.3
Scaup	4.3	2.7	1.8	-	5.0	-	3.9	3.0	1.1
Golden-eye	-	0.1	0.4	-	1.1	0.5	-	0.2	0.4
Bufflehead	0.8	0.5	-	-	0.6	-	0.7	0.4	-
W. W. Scoter	0.3	0.1	-	-	-	-	0.3	Tr.	-
Surf Scoter	-	0.1	-	-	-	-	-	Tr.	-
Ruddy	0.5	0.1	1.2	-	-	-	0.4	Tr.	0.7
Unidentified	-	-	0.9	-	-	-	-	-	0.5
C. Goose	-	-	Tr.	-	1.7	-	-	0.2	Tr.
S. Goose	-	2.0	Tr.	-	-	-	-	1.5	Tr.
No. in Sample	627	863	887	63	180	547	690	1043	1434
No. Hunters	310	647	418	62	163	257	372	810	675
Birds/Hunter	2.02	1.33	2.12	1.02	1.04	2.13	1.85	1.29	2.12

Table 3. Yearly comparisons by percentages of the data obtained at the Flathead voluntary checking station.

	1st Half of Season			2nd Half of Season			Total for Season		
	1948	1949	1950	1948	1949	1950	1948	1949	1950
Mallard	61.3	52.7	35.9	60.8	66.3	86.7	60.9	57.1	57.0
Gadwall	3.2	1.9	1.1	2.4	0.6	0.8	2.8	1.4	1.0
Baldpate	6.2	18.2	26.1	18.1	12.0	1.4	12.9	16.1	15.8
Pintail	5.7	4.2	7.0	3.2	4.6	2.5	4.3	4.3	5.1
G. W. Teal	5.3	7.9	14.0	3.2	0.6	1.2	4.1	5.5	8.7
B. W. Teal	3.0	2.8	3.5	0.4	0.3	-	1.6	1.9	2.0
Shoveller	2.0	3.7	2.5	0.6	1.5	0.8	1.2	2.9	1.8
Wood Duck	-	-	0.2	-	-	-	-	-	0.1
Redhead	7.8	2.8	4.0	3.0	0.6	0.4	5.1	2.0	2.5
Ring-necked	1.0	0.1	-	-	0.6	-	0.4	0.2	-
Canvas-back	-	-	0.1	0.8	-	-	0.4	-	Tr.
Scaup	2.2	1.9	0.2	2.8	2.8	0.4	2.5	2.1	0.3
Golden-eye	0.7	0.7	0.7	3.0	3.7	0.4	2.0	1.6	0.6
Bufflehead	1.0	0.9	0.4	1.8	0.3	0.2	1.4	0.6	0.3
Ruddy	0.2	0.6	0.2	-	-	-	0.1	0.3	0.1
Unidentified	-	-	-	-	-	0.6	-	-	0.2
Coot	-	-	0.7	-	-	-	-	-	0.4
C. Goose	-	1.3	2.5	-	6.1	4.2	-	2.8	3.2
Snow Goose	-	-	-	-	-	-	-	-	-
No. in Sample	397	681	670	502	326	476	899	1007	1146
No. Hunters	258	387	353	556	328	240	814	715	593
Birds/Hunter	1.54	1.76	1.90	0.90	0.99	1.98	1.10	1.41	1.93

Table 4. Yearly comparisons by percentages of data obtained at the Bitterroot checking station.

	1st Half of Season			2nd Half of Season			Total For Season		
	1948	1949	1950	1948	1949	1950	1948	1949	1950
Mallard	76.3	65.5	64.2	93.4	92.1	92.0	83.5	75.3	79.0
Gadwall	-	0.7	-	0.4	-	-	0.2	0.4	-
Baldpate	8.0	5.9	9.5	1.7	0.8	1.8	5.3	4.0	5.5
Pintail	0.6	2.9	4.4	0.8	2.7	0.6	0.7	2.9	2.5
G. W. Teal	6.8	15.5	13.2	0.8	2.3	2.7	4.2	10.7	7.7
B. W. Teal	1.7	0.7	2.3	-	0.4	-	0.9	0.6	1.1
Shoveller	0.6	0.9	1.5	-	-	-	0.4	0.6	0.7
Wood Duck	5.4	1.4	3.1	0.8	-	-	3.5	0.9	1.5
Redhead	-	0.7	0.2	-	-	-	-	0.4	0.1
Ring-necked	-	0.9	-	0.4	-	-	0.2	0.6	-
Canvas-back	-	0.5	-	-	-	-	-	0.3	-
Scaup	-	0.7	-	0.4	-	0.6	0.2	0.4	0.4
Golden-eye	-	-	-	0.8	-	1.1	0.4	-	0.6
Bufflehead	-	0.7	-	0.4	-	0.2	0.2	0.4	0.1
Ruddy	0.6	2.0	0.2	-	-	-	0.4	1.3	0.1
Unidentified	-	1.1	0.2	-	0.8	0.2	-	1.0	0.2
C. Goose	-	-	0.2	-	0.8	0.2	-	0.3	0.2
S. Goose	-	-	0.2	-	-	-	-	-	-
No. in Sample	312	443	378	237	255	430	549	698	808
No. Hunters	267	346	299	193	203	205	460	549	504
Birds/Hunter	1.17	1.28	1.26	1.23	1.27	2.10	1.19	1.27	1.60



Table 5. Yearly comparisons by percentage of the waterfowl kill in Montana as determined, from voluntary checking stations.

	1st Half of Season			2nd Half of Season			Total for Season		
	1948	1949	1950	1948	1949	1950	1948	1949	1950
Mallard	67.9	58.3	51.1	72.3	77.5	92.5	69.6	63.3	67.5
Gadwall	1.5	2.3	3.2	1.6	0.7	0.5	1.5	1.9	2.1
Baldpate	6.1	9.6	14.7	12.0	6.2	1.0	8.3	8.7	9.3
Pintail	5.3	6.7	7.1	2.5	3.4	1.3	4.3	5.9	4.8
G. W. Teal	5.0	9.2	9.9	2.4	1.2	1.4	4.0	7.1	6.5
B. W. Teal	2.1	2.3	3.5	0.3	0.3	-	1.4	1.8	2.1
Shoveller	2.7	3.0	3.5	0.9	1.8	0.3	2.0	2.7	2.3
Wood Duck	1.3	0.3	0.6	0.3	-	-	0.9	0.2	0.4
Redhead	2.8	2.0	1.7	1.9	0.4	0.2	2.4	1.6	1.1
Ring-necked	0.3	0.5	Tr.	0.1	0.3	-	0.2	0.4	Tr.
Canvas-back	0.8	0.4	0.3	0.6	0.3	-	0.7	0.4	0.2
Scaup	2.9	2.2	1.0	1.6	2.4	0.3	2.4	2.3	0.7
Golden-eye	0.2	0.4	0.6	2.1	1.8	1.4	0.9	0.7	0.6
Bufflehead	0.7	0.7	0.4	1.2	0.3	-	0.9	0.6	0.2
W. W. Scoter	0.2	Tr.	-	-	-	-	0.1	Tr.	-
Surf Scoter	-	Tr.	-	-	-	-	-	Tr.	-
Ruddy	0.5	0.6	0.7	-	-	-	0.3	0.5	0.4
Unidentified	-	0.2	0.4	-	0.3	Tr.	-	0.2	0.2
C. Goose	-	0.4	0.9	-	3.3	1.5	-	1.2	1.1
S. Goose	-	0.7	0.1	-	-	-	-	0.5	Tr.
Coot	-	-	0.3	-	-	-	-	-	0.2
No. in Sample	1336	2176	2196	802	761	1447	2138	2937	3643
No. of Hunters	835	1479	1207	821	694	702	1656	2173	1909
Birds/Hunter	1.6	1.47	1.82	0.98	1.10	2.06	1.29	1.35	1.91

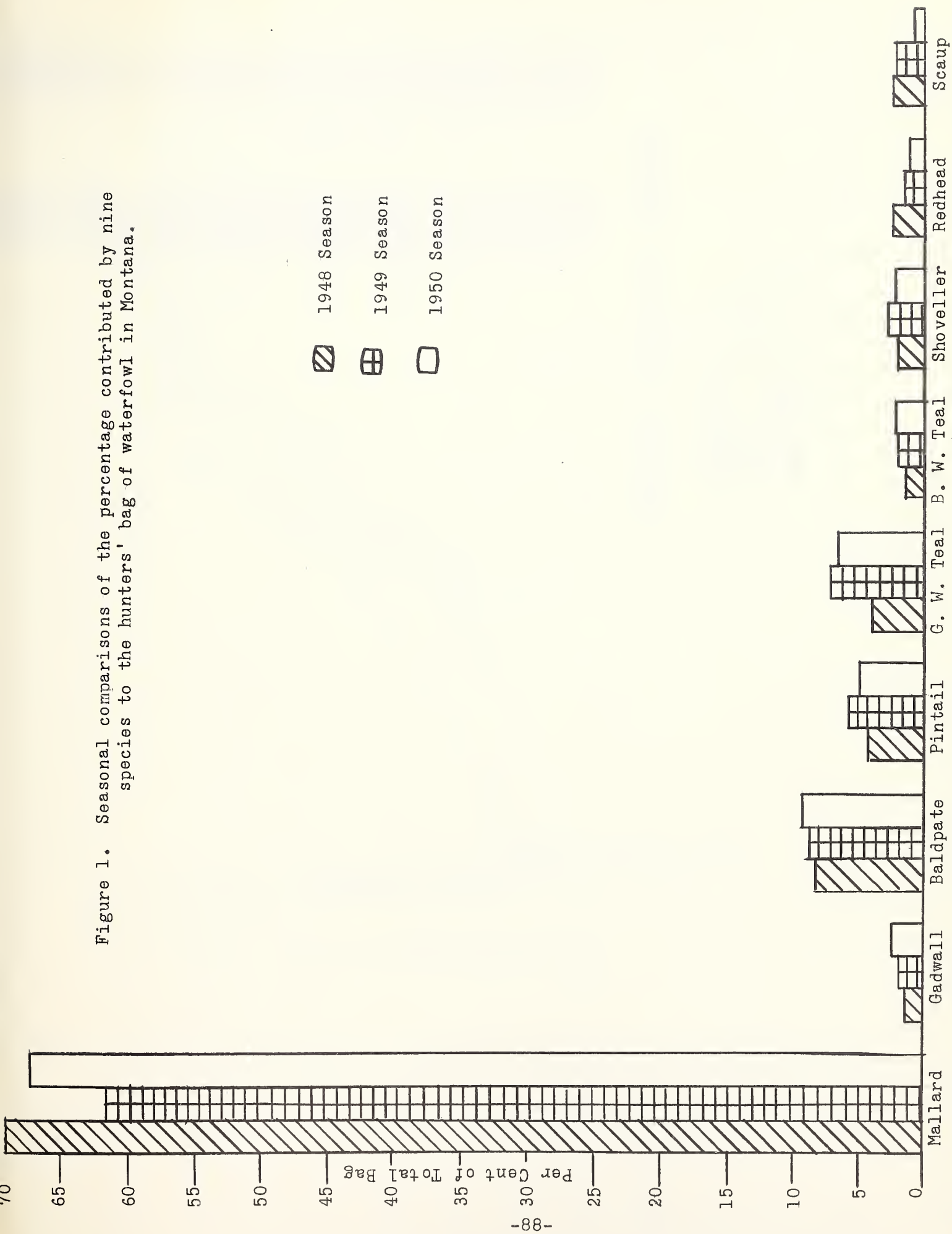
Table 6. Information on the first half of the waterfowl hunting season obtained from hunter interviews.

Area of Check	No. of Hunters	No. Days Hunted	Ducks Killed	Avg. No. Days Hunted	Ducks/Day	Ducks/First Half
Great Falls	238	568	1396	2.4	2.4	5.8
Flathead	699	800	1538	1.1	1.9	2.1
Bitterroot	57	86	16	1.5	0.2	0.3
Total 1950	994	1,454	2,950	1.5	2.0	3.0
Total 1949	417	1,045	1,904	2.5	1.8	4.6

Table 7. Sex and age ratios of mallards bagged during the 1950 waterfowl season.

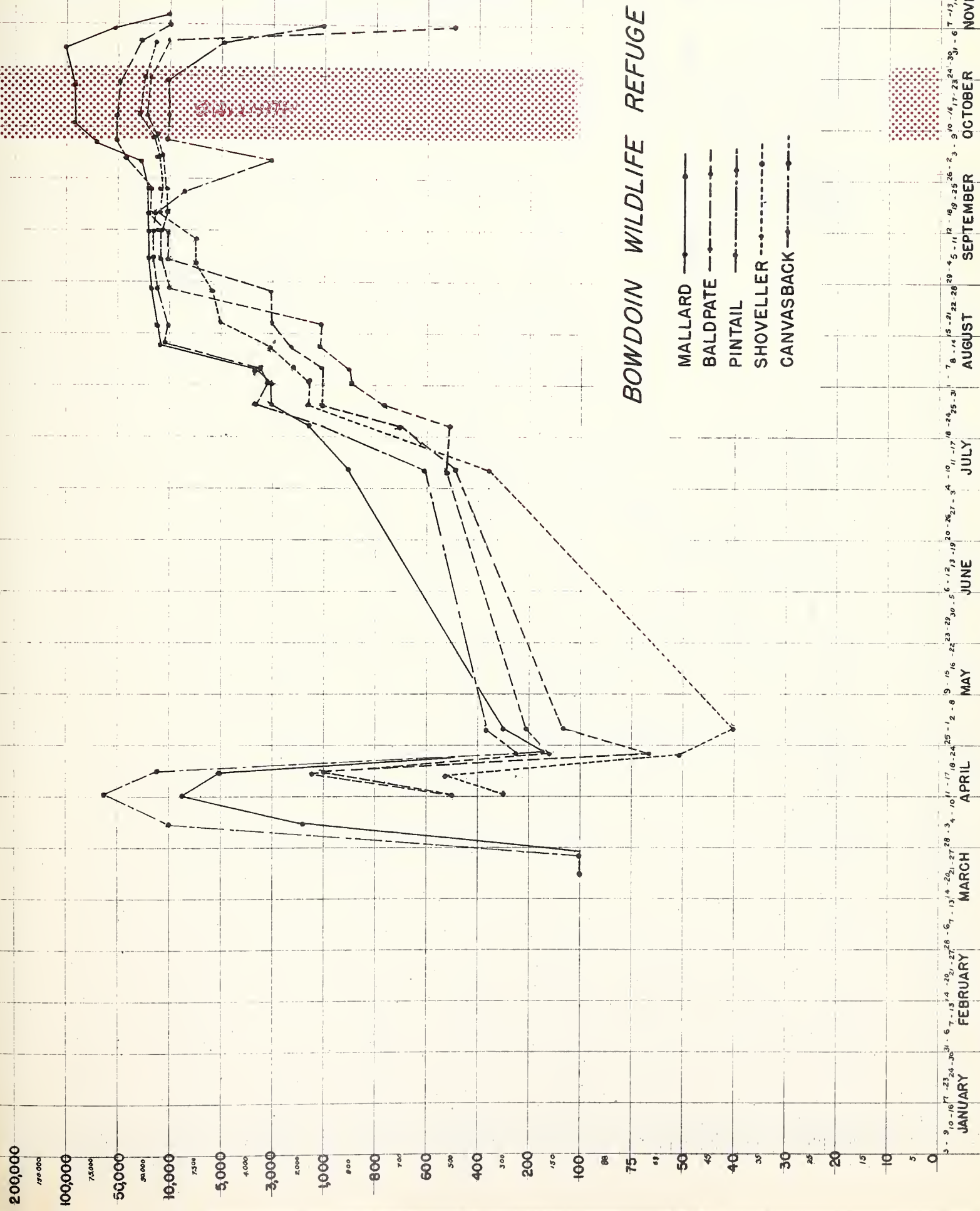
Area	Male		Female		Juv. Females /		Males /		Adult M /		Juv. M /	
	A	J	A	J	100 Adults	100 A. Female	100 Females	100 Adult F.	100 Adult F.	100 Juv. F.	100 Juv. F.	100 Juv. F.
<u>1st Half of Season</u>												
Great Falls	179	73	107	94	58	88	131	167	78			
Flathead	62	48	75	28	55	37	107	83	171			
Bitterroot	62	40	88	53	62	60	72	70	75			
Blackfoot	33	31	40	21	71	53	105	83	148			
Total 1950	336	192	310	196	60	63	104	108	98			
Total 1949					92	92	123	123	122			
<u>2nd Half of Season</u>												
Great Falls	380		153				248					
Flathead	259		150				173					
Bitterroot	263		129				204					
Total 1950	902		432				209					
Total 1949							151					

Figure 1. Seasonal comparisons of the percentage contributed by nine species to the hunters' bag of waterfowl in Montana.

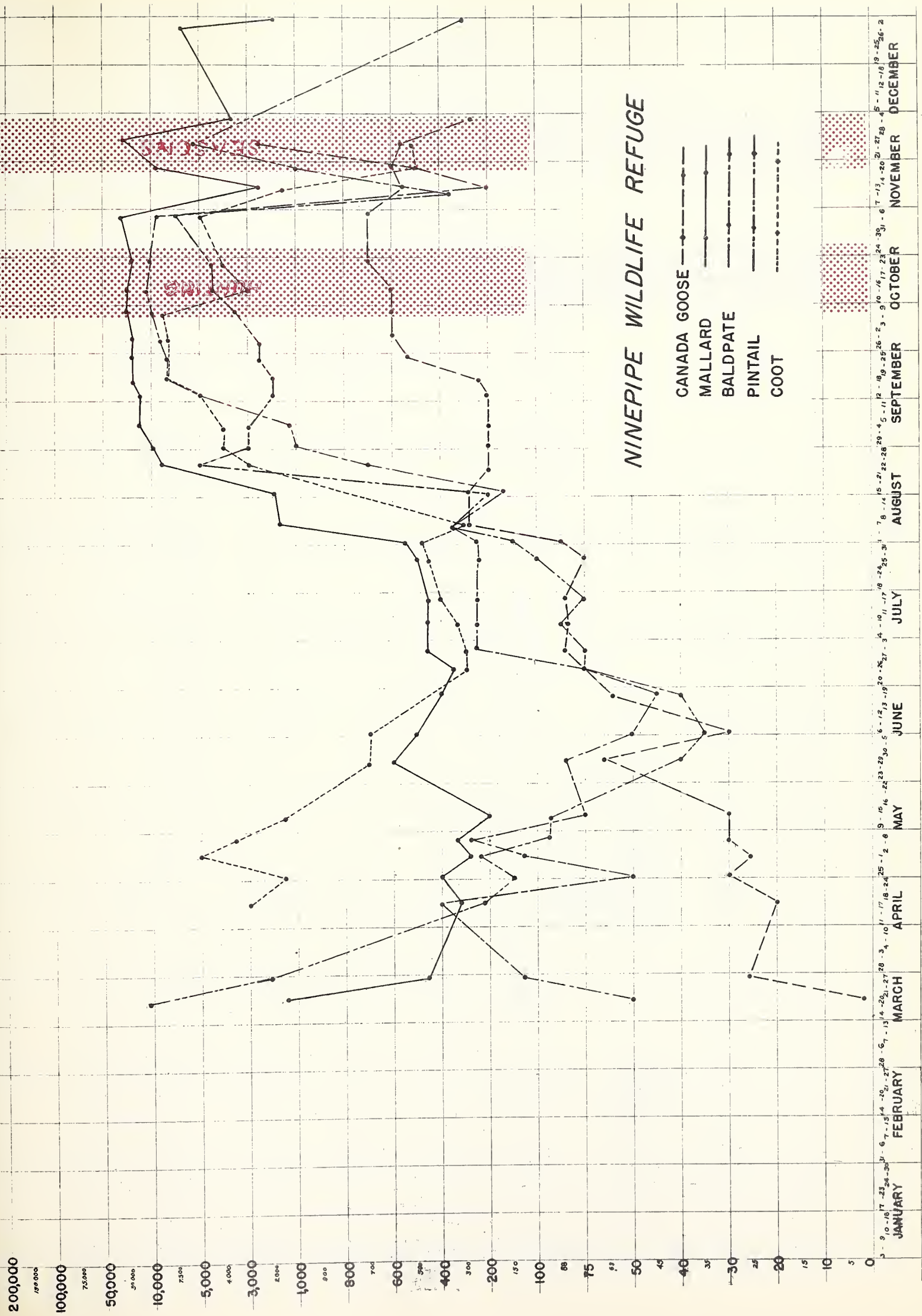






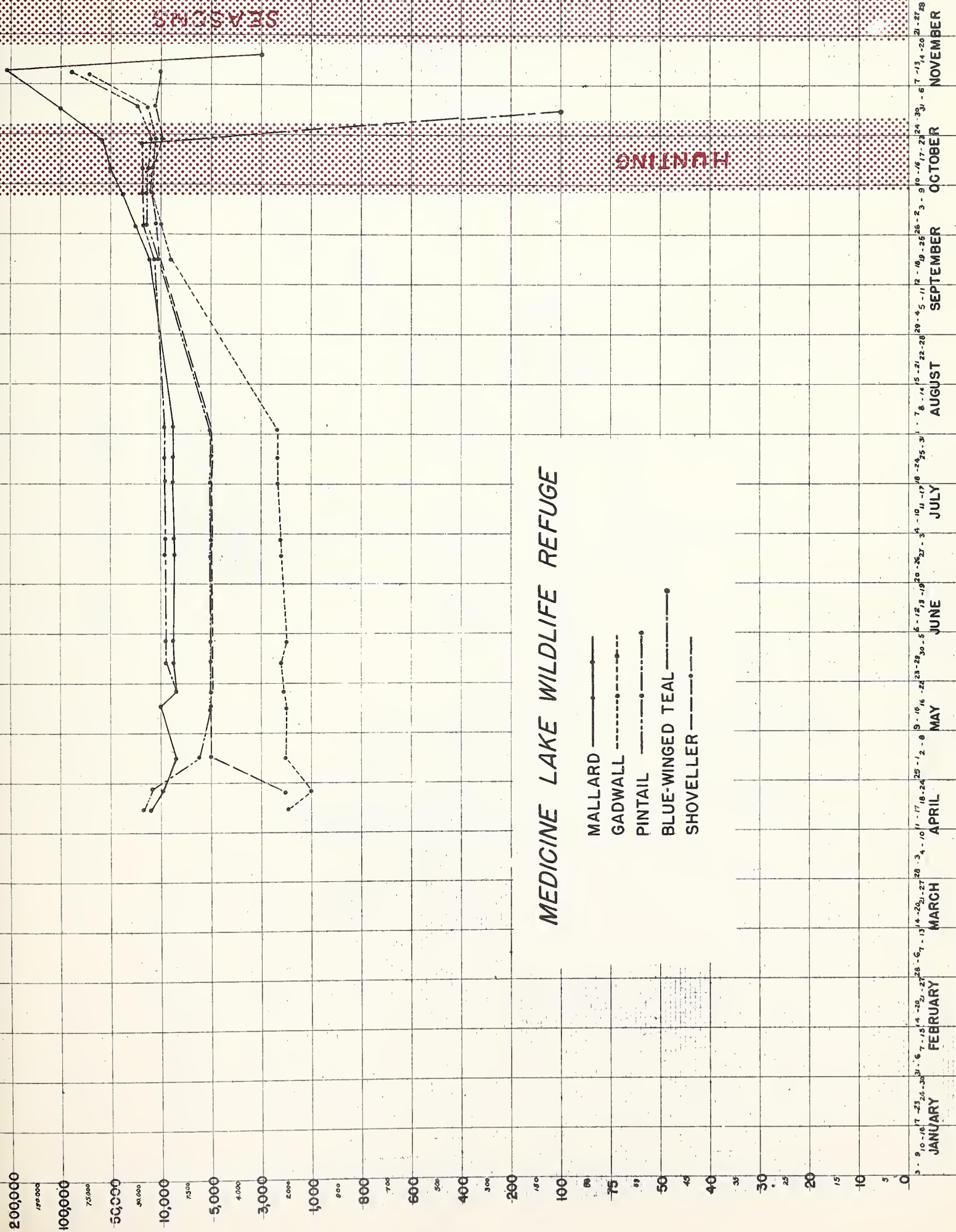










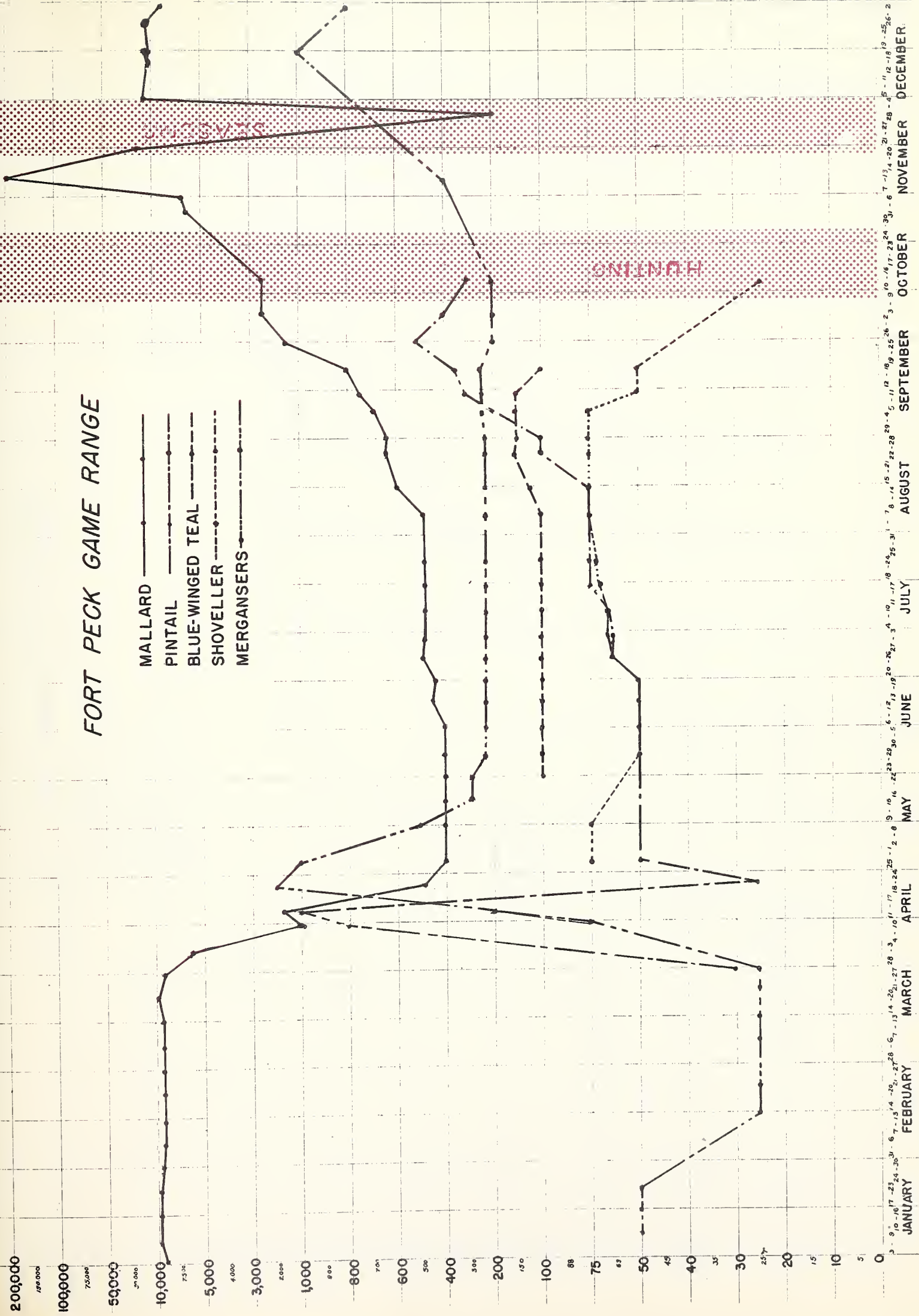






# FORT PECK GAME RANGE

- MALLARD ———
- PINTAIL ———
- BLUE-WINGED TEAL ———
- SHOVELLER - - - - -
- MERGANSERS ———





MALLARD  
BALDPATE  
PINTAIL  
SCAUP  
COOT



JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER		OCTOBER		NOVEMBER		DECEMBER	
9	10	17	23	30	6	13	20	27	3	10	17	24	31	7	14	21	28	4	11	18	25	31	
1	8	15	22	29	5	12	19	26	1	8	15	22	29	5	12	19	26	2	9	16	23	30	
2	9	16	23	30	6	13	20	27	2	9	16	23	30	6	13	20	27	3	10	17	24	31	
3	10	17	24	31	7	14	21	28	3	10	17	24	31	7	14	21	28	4	11	18	25	31	
4	11	18	25	31	8	15	22	29	4	11	18	25	31	8	15	22	29	5	12	19	26	31	
5	12	19	26	31	9	16	23	30	5	12	19	26	31	9	16	23	30	6	13	20	27	31	
6	13	20	27	31	10	17	24	31	6	13	20	27	31	10	17	24	31	7	14	21	28	31	
7	14	21	28	31	11	18	25	31	7	14	21	28	31	11	18	25	31	8	15	22	29	31	
8	15	22	29	31	12	19	26	31	8	15	22	29	31	12	19	26	31	9	16	23	30	31	
9	16	23	30	31	1	8	15	22	9	16	23	30	31	1	8	15	22	10	17	24	31	31	
10	17	24	31	31	2	9	16	23	10	17	24	31	31	2	9	16	23	11	18	25	31	31	
11	18	25	31	31	3	10	17	24	11	18	25	31	31	3	10	17	24	12	19	26	31	31	
12	19	26	31	31	4	11	18	25	12	19	26	31	31	4	11	18	25	1	8	15	22	31	
13	20	27	31	31	5	12	19	26	1	8	15	22	31	5	12	19	26	2	9	16	23	31	
14	21	28	31	31	6	13	20	27	2	9	16	23	31	6	13	20	27	3	10	17	24	31	
15	22	29	31	31	7	14	21	28	3	10	17	24	31	7	14	21	28	4	11	18	25	31	
16	23	30	31	31	8	15	22	29	4	11	18	25	31	8	15	22	29	5	12	19	26	31	
17	24	31	31	31	9	16	23	30	5	12	19	26	31	9	16	23	30	6	13	20	27	31	
18	25	31	31	31	10	17	24	31	6	13	20	27	31	10	17	24	31	7	14	21	28	31	
19	26	31	31	31	11	18	25	31	7	14	21	28	31	11	18	25	31	8	15	22	29	31	
20	27	31	31	31	12	19	26	31	8	15	22	29	31	12	19	26	31	9	16	23	30	31	
21	28	31	31	31	1	8	15	22	9	16	23	30	31	1	8	15	22	10	17	24	31	31	
22	29	31	31	31	2	9	16	23	10	17	24	31	31	2	9	16	23	11	18	25	31	31	
23	30	31	31	31	3	10	17	24	11	18	25	31	31	3	10	17	24	12	19				





# PABLO WILDLIFE REFUGE

- CANADA GOOSE - - - - -
- MALLARD - - - - -
- BALDPATE - - - - -
- PINTAIL - - - - -
- COOT - - - - -

200,000

150,000

100,000

75,000

50,000

25,000

10,000

7,500

5,000

4,000

3,000

2,000

1,000

800

600

400

200

100

75

50

45

40

35

30

25

20

15

10

5

0

JANUARY

FEBRUARY

MARCH

APRIL

MAY

JUNE

JULY

AUGUST

SEPTEMBER

OCTOBER

NOVEMBER

DECEMBER

HUNTING

STAGS

JANUARY: 1-10, 17-23, 26-31  
 FEBRUARY: 6-7, 13-14, 20-21, 27-28  
 MARCH: 1-13, 14-20, 27-28  
 APRIL: 1-10, 11-17, 18-24, 25-31  
 MAY: 9-16, 22-23, 29-31  
 JUNE: 5-12, 19-20, 26-30  
 JULY: 4-10, 11-17, 18-24, 29-31  
 AUGUST: 7-8, 14-15, 21-22, 28-29  
 SEPTEMBER: 5-11, 17-18, 25-26  
 OCTOBER: 2-9, 16-17, 23-24, 30-31  
 NOVEMBER: 7-13, 20-21, 27-28  
 DECEMBER: 5-11, 12-18, 19-25, 26-31

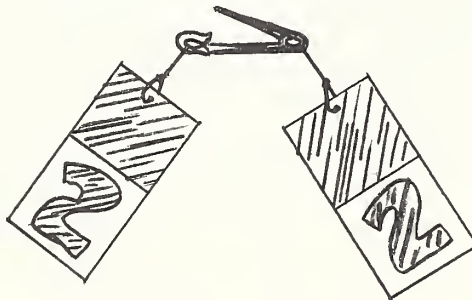


WINTER BANDING AND EXPERIMENTAL MARKING OF WATERFOWL  
FOR FIELD IDENTIFICATION

INTRODUCTION:

Marking of upland game birds for field identification has been attempted for a number of years. Taber (1949) used "koroseal" tags with different-colored numerals, which he attached to the back of the neck of a pheasant with a #2 silver-plated safety pin (Figure 1). One piece of the tag hung down on either side of the neck and could be distinguished at 300 yards with a 20-power telescope.

Figure 1. Taber's "koroseal" pheasant tag.



Leopold, Lee, Anderson (1938) and Edminster (1938) and Heydweiller (1935) used dyed chicken feathers attached to the tail feathers of ruffed grouse and pheasants. Sowls (1950) tried this method on waterfowl, but the attempts proved unsuccessful because of the relatively small size of the duck tail feathers which afforded attachment for the dyed chicken feathers.

Trippensee (1941) used pyralin tags in a number of colors on ruffed grouse and pheasants. The tags, which were attached to the dorsal side of the tail feathers, were difficult to see at 800 feet with 8-power glasses. In most observations, the tags could be clearly distinguished at about 100 feet with 10-power glasses.

Edminster (1938) used nickel-plated catbells on ruffed grouse which could be distinctly heard at 100 feet. He also used a limited amount of tail feather clipping, which proved satisfactory, lasting throughout most of the summer. Sowls (1950) reports that feather imping was attempted at Delta in 1947 but proved unsatisfactory.

Moffit (1947) applied aniline dyes on sage grouse but stated that "dyes would probably not be effective on birds without moderately light-colored pelage."

Jones (1950) found that pheasants, rolled in a pan of red rhodamine B-extra and kept overnight to dry before releasing, retained the dye for three months or more. He stated that, "under favorable light conditions and without the aid of binoculars, these pheasants were identified accurately from over a quarter of a mile."

Wadkins (1948) sprayed alcohol and acetate base dyes on pheasants with a hand spray. Thirty-three per cent alcohol base rhodamine B-extra faded less and lasted longer than either malachite green, brilliant green or purple batik,



but all dyes worked sufficiently well for field identification.

Recently Sowls (1950) has conducted marking experiments on waterfowl in relation to reneesting studies. He utilized oil paints, enamels and artists paints, but found the faster-drying airplane dope paint to be much more convenient and effective for field use. By applying the dope to the dorsal surface of both the proximal ends of the wings and the tail, he was able to obtain 62 color combinations for each sex of each species using three colors--red, yellow and white. He states that these markings were visible in flight up to 500 yards with 8-power glasses and lasted about two months.

Salinas (letter) in conducting a similar study at the time of this writing near Fort Missoula, Montana. He earlier used a "bow-tie" similar to that used by Wint in Oklahoma, but abandoned it later for a more durable "necktie" which he made from red translucent plastic (Figure 2). Four out of 90 mallard hens, tagged with these ribbons, have been observed in the field a week or more after tagging. Salinas stated that the tags can be easily seen with the unaided eye at about 75 yards.

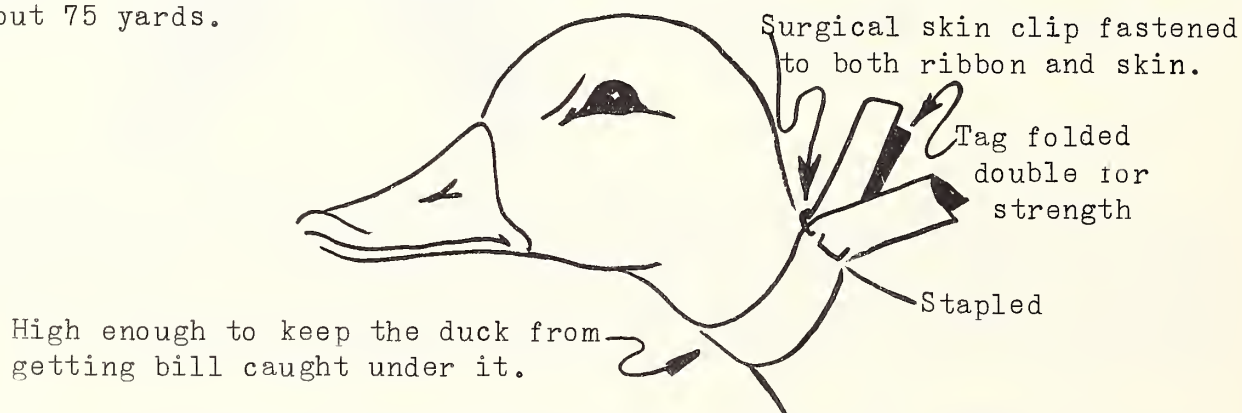


Figure 2 "Necktie" tag used by Salinas

This report covers a research project conducted on the use of plastic markers on waterfowl for possible application in waterfowl population and nesting studies. The project, under the direction of Wynn G. Freeman, Waterfowl Biologist for the State of Montana, and under the supervision of Dr. D. C. Quimby, Professor of Zoology, Montana State College, was carried out on the Manhattan Game Preserve near Bozeman, Montana from January 19 to March 10, 191.

The type of material and method of attachment used in this project were patterned after Wint's (letter) work with pheasants in Oklahoma, in which he used tags made out of Montgomery Ward imitation leather plastic upholstery. The tags (Figure 3), which had numerals heat-sealed on for individual identification, were attached to the feather tract on the back of the neck with a 22mm. surgical skin clip. One of these tags remained on a pheasant for eight months.



Figure 3. Wint's Pheasant Tag

## MATERIALS:

The four types of plastic material, used in the tagging experiments are described below:

Type A - A single layer tag of Montgomery Ward Solid yellow window drapes of 0.07mm. thickness was used.

Type B - Bright yellow plastic table cover material of 0.3mm. thickness was used with the solid colored side out and the mottled side in.

Type C.- A yellow, translucent "koroseal" of 0.09mm. thickness was used. Both a single-thickness and a three-layered heat-fused tag were used. "Koroseal" can be purchased at most any larger department store.

Type D - Plastic table cover material of 0.28mm. thickness, very similar to Type B, but more lemon-yellow was used. Both Type B and D were purchased at the Hart-Albin Department Store in Billings, Montana.

Three different length tags, 3", 5" and 7", were used in the tagging. The length as stated refers to the total length of the tag (Figure 4). The tags were patterned after those of Wint's (Figure 3), but the numerals were not used for individual identification. The corners were rounded to prevent tearing or snagging. The hole for the surgical skin clip was punched with a common ticket punch.

A 14mm. surgical skin clip was used to attach the tags to the feather tract on the back of the duck's neck in the manner shown in Figure 5 and 6. A pair of surgical forceps was used to fasten the clips after they had been inserted through the hole. The dimensions of the size tag used most commonly and the clipping position are shown in Figure 4.

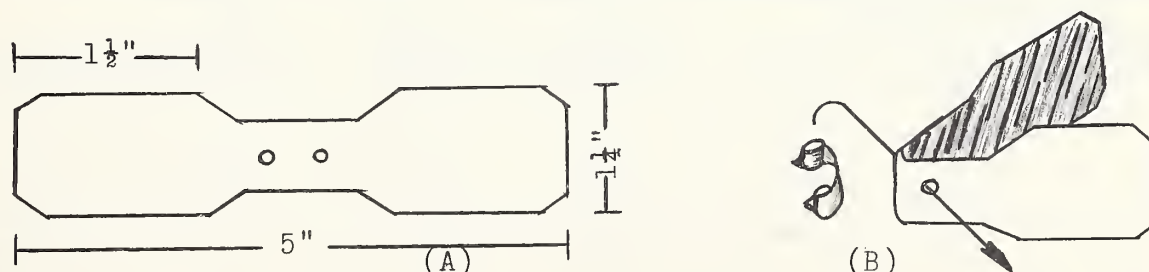


Figure 4. (A) Dimensions and (B) Clipping position of the 5" plastic duck tag.

## PROCEDURE:

The general study area was surveyed three times weekly. The duck trap was baited during the first two visits. The banding and tagging was done on the second and third visits.

The plastic tags were applied by pushing the feathers to one side on the



back of the neck and lifting the skin up about  $\frac{1}{2}$  inch, then fastening the clip so that the two points met inside the skin and overlapped. The tag was attached at the level of the white ring on the mallard drake's neck and at a corresponding level on the hen's neck. Mallards were the only species of waterfowl trapped during the research project.

Retrapped ducks that had lost their tags were retagged and the information recorded. Any sign of infection or skin damage that was noticed was also recorded. All tags and clips still remaining on any ducks were banded with Federal Fish and Wildlife duck bands at the same time that they were tagged.

As the ducks were released from the trap after banding and tagging, they were observed with both the naked eye and with 8-power glasses. After all ducks that were in the trap had been tagged and released, a survey was made in the general area to determine if any of the ducks just tagged or from previous taggings could be distinguished. Upon approaching the area and trap each visit, a check of all ducks flushed was made to observe any marked ducks that might be present. In addition, two small spring creeks running alongside the road, usually frequented by scattered pairs and smaller flocks, were carefully watched from the car each trip. Both of these creeks ran within one mile of the trap.

#### OBSERVATIONS AND RESULTS:

From January 19 to March 11, 1951, one hundred and eighty-three mallards were banded with Federal Fish and Wildlife bands (Table 1). Five mallards, representing 6.8 per cent of the ducks banded at the same location in 1950, were trapped again in 1951. Two mallards, which had both been banded at Toston in March of 1949, were taken in the trap.

Table 1. Ducks banded and retrapped.

Species	Total Banded	Total ducks Retrapped	No. of individuals re-trapped	No. of times individual ducks were retrapped						
				1	2	3	4	5	6	7
Mallard-drakes	137	64	30	15	8	1	1	2	1	1
hens	46	12	8	5	2	2				
Totals	183	76	38	20	10	3	1	2	1	1

The sex ratio of all ducks banded was approximately 300 males to 100 females. The sex ratio showed a definite variation between the earlier and later periods during the project (Table 2). In the period from January 19 to February 22, the sex ratio was approximately 200 drakes to 100 hens. In the latter period, February 23 to March 10, the sex ratio jumped to 510 males to 100 females. This increase of drakes may have been due to the arrival of early migrants, a movement in local populations or may possibly be attributed to some other unknown factor. There was a noticeable increase in the number of ducks using the preserve as a resting spot during the latter period and several species of waterfowl, pintails, baldpates, gadwalls and green-winged teal, were seen

that had not been observed during the mid-winter months.

Table 2. Sex ratio of waterfowl banded during specific periods.

Species	Sex	Total Banded	
		Jan. 19 - Feb. 22	Feb. 23 - March 10
Mallard	Male	60	77
	Female	31	15
	Sex Ratio	194:100	513:100

Thirty-eight individuals were retrapped a total of 78 times. Fifty-two and six-tenths per cent of the retrapped ducks repeated once; 26.3 per cent repeated twice; 7.9 per cent repeated three times; 2.6 per cent repeated four times; 5.3 per cent repeated five times; and 5.2 per cent repeated six or more times. One drake was trapped nine of the eleven times the trap was operated. The sex ratio of retrapped ducks was 550 males to 100 females, considerably higher than the over-all sex ratio for the total ducks banded (300 males to 100 females). This may suggest that the mallard drake is more susceptible to retrapping than the hen.

One hundred and ninety-seven plastic tags were attached to mallards during the two-month period. Control tagged ducks were not kept in order to determine the durability of the different type tags on captive birds.

Returns were obtained on 32 per cent of the tags attached, but only 20.6 per cent of the ducks retrapped retained their tags for one or more weeks. One tag, a type D, remained on at the end of three weeks (Table 3).

Table 3. Tagging statistics.

Type Material	Number of Tags Attached	Number of Returns	No. of tags remaining	Length of time tags remained attached		
				1 wk	2 wks	3 or more wks
Type A 3"	1	0				
5"	26	10	0			
7"	15	7	0			
Type B 5"	74	18	6	5	1	
Type C 5"	6	3	0			
7"	7	2	0			
C(3)5"	17	3	0			
Type D 5"	51	20	7	6		1
Totals	197	63	13	11	1	1

Types B and D were the only materials used that remained attached for more than one day. Types A and C were apparently of insufficient strength to withstand the buffeting during flight, feeding, etc. The type C "koroseal"

was tried with three thicknesses heat-fused together with an iron, but even then did not last more than one day. Both Type A and C usually tore away leaving the clip imbedded in the skin of the neck. The heavier Types B and D frequently tore away pulling the clip with them. When either Type B or D tags were still present on trapped birds, the two halves had inevitably fused together and lay on one side or the other of the duck's neck, rather than standing up in their original position as shown in Figures 5 and 6. The cold weather made the tags, especially Type A, noticeably more brittle and may have had some effect on the rapid loss.

The 22mm. skin clip proved too small to hold the tag to the skin. All tags fastened with the 22mm. clips had been lost the next day on all retrapped ducks.

One skin wound was quite noticeable where a tag had pulled out taking the clip with it. A few ducks had scars partly or nearly healed when retrapped, but no sign of the previous tagging could be found on most retraps. As far as could be determined from retrapped ducks, the surgical skin clips did not cause any infections or permanent damage.

Two tags, one A and one D, were lost in the trap, possibly due to the ducks jumping against the top and sticking their necks through the wire in an attempt to escape. Two other lost tags were recovered in Baker Creek, both within 300 yards of the duck trap.

In observing the ducks as they were released, all four types of tags could usually be distinguished at 75 yards with the naked eye. With 8-power glasses the B and D tags could be distinguished at 250 to 300 yards. Types A and C were more difficult to make out at greater distances. Recognition was facilitated if the duck remained flying low contrasted against the darker underbrush. The tags of all types were difficult to distinguish when the ducks flew up and away from the observer. Sometimes the tags, especially the more flexible Types A and C, immediately flopped over on one side or the other of the duck's neck and could not be distinguished at all when the duck was flying away from the observer. Tags were most readily perceived from a lateral position.

The three-inch tags were discarded immediately after the first one had been attached because they did not project far enough out from the feathers on the back of the neck to afford easy identification. The five-inch lengths were used most commonly for the Type A and C tags, and were used exclusively for the Type B and D tags (Table 3). The seven-inch tags did not seem to be any more readily identified than the five-inch tags.

Only three tagged mallard drakes were seen in the field during the daily surveys. One was seen in flight at about 200 yards with 8-power glasses, the other two were seen while the ducks were sitting on the water. One of the tagged drakes was observed while it was sitting on the water just in front of the duck trap at a distance of 120 yards with 8-power glasses. The tag appeared very distinct while the duck was sitting on the water and was noticeable for another 100 yards after the bird had taken flight. The third drake was observed on one of the small creeks running alongside the road. The duck was seen from the car at about six yards with the naked eye. Its tag was hanging down on one side of its neck and couldn't be seen after the duck flushed because the tag



hung down on the side of the neck opposite the observer. None of the tags were identified as to material, but the two tags seen while the ducks were sitting on the water appeared more like Type B or D because of their rigid appearance.

The large number of ducks using the area as a resting spot during the last month of the project made field observations difficult. Frequently flocks, appearing as large as 2,000 birds, were flushed at one time making it impossible to observe all ducks for tags.

A correlation of trapping success and weather was apparent. No ducks were taken in the trap when the ground was free of snow and the weather was warm or mild. The ducks also hesitated to enter the trap when it was entirely free from ice which had condensed on the wire during colder temperatures.

#### SUMMARY:

1. One hundred and eighty-three mallards were banded with Federal Fish and Wildlife Service bands from January 19 to March 10, 1951. No other species of waterfowl were caught in the trap.

2. Five mallards, representing 6.8 per cent of the ducks banded at the same location in 1950, were trapped again in 1951. Two mallard drakes that had been banded in March, 1949, at Toston, were retrapped during this operation.

3. Thirty-eight individuals were retrapped a total of 78 times. Forty-seven per cent of the retrapped ducks repeated twice or more.

4. One hundred and ninety-seven plastic tags were attached to mallards during the two-month period.

5. The marking experiments utilized four types of plastic tag material. They were: Window drapes, "koroseal" and two types of table covering material.

6. From the returns on 32 per cent of the tags, 20.6 per cent of the ducks had retained their tags for one or more weeks.

7. Only one tag, a Type D, remained on at the end of three weeks.

8. Types A and C did not remain attached for even one day on the ducks retrapped.

9. The 22mm. skin clips were apparently too small to hold the tags securely.

10. Four lost tags were found in the area within 300 yards of the trap.

11. Three tagged ducks were identified during field observations.

12. The tags could be identified at 300 yards with 8-power glasses or at 75 yards with the unaided eye.

13. The sex ratio of all ducks banded was 300 males to 100 females. The sex ratio of retrapped ducks was 510 males to 100 females.

14. There were considerable more drakes banded the last half of the project than the first half.

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Submitted by:

Richard Smith, Student Assistant  
Wildlife Restoration Division





(A)



(B)

Figure 5. Tagging mallard drakes







(A)



(B)

Figure 6. Tagging mallard hens



STATE Montana  
PROJECT 5-D  
DATE April 15, 1951

ABSTRACT

General Wildlife Restocking

During the quarter, 310 antelope were trapped and released in good condition. Two hundred and fifty were captured in Yellowstone Park and 60 were trapped near Roundup.

Project personnel were employed during the major portion of this quarter on elk trapping and were paid accordingly out of non-P.R. funds.





STATE Montana  
 PROJECT 5-D  
 DATE April 15, 1951

QUARTERLY PROGRESS REPORT

For

DEVELOPMENT

As Required By

FEDERAL AID IN WILDLIFE RESTORATION ACT

1. Title of Project: General Wildlife Restocking Project

2. Project Personnel: James McLucas, Foreman

James Huggins, Fieldman

3. Report of Progress:

ANTELOPE RELEASES, WINTER 1951

Trapping Sites: Yellowstone Natl. Park - 250, Miller Lake - 60.

Date	Area Released	Does	Doe Fawns	Buck Fawns	Bucks	Total
Jan. 21, 1951	Polson-Irving Flats	15	4	10	7	36
Feb. 13, 1951	Ennis-Wigwam Cr.	12	9	5	4	30
Feb. 13, 1951	Ennis-St. Joseph Cr.	11	6	1	12	30
Feb. 14, 1951	Ennis-Spring Cr.	5	3	2	8	18
Feb. 14, 1951	Moiese Range	7	4	4	-	15
Feb. 15, 1951	Little Bitterroot Hills	8	7	5	10	30
March 29, 1951	Medicine Lake	11	6	10	5	32
March 29, 1951	Tiger Butte	10	4	8	6	28
Total for State						219
Antelope Released Out of State						
Jan. 21, 1951	Theodore Roosevelt Natl. Park, N. Dak.	60% Does		40% Bucks		75
Jan. 20, 1951	Wind Caves, S. Dak.				12	12
Feb. 15, 1951	Toledo Ohio Zoo		2	2		4
Total Out of State						91
Grand Total						310

Following the perfection of the technique of antelope trapping, Montana has succeeded in catching over 3,500 of this species. As a result, most of the suitable areas have received preliminary stocking.

This year's trapping was concentrated in Yellowstone Park and at Miller's Lake near Roundup. These areas are recognized as regions of heavy antelope populations and thus good sources for stocking.

In return for the antelope and assistance of ranger personnel on trapping operations, 91 pronghorns were released to the National Park Service for transplanting in other National Parks.

#### ANTELOPE TRANSPLANTING

Winter 1951

##### TRAPPING SITE:

Yellowstone National Park

##### DATES:

January 18 - 21, 1951

February 12 - 15, 1951

##### PROCEDURE:

The antelope trap was set up in Yellowstone National Park in January, 1951. It was put into operation January 18 and 19 when 125 antelope were trapped. The following day 87 antelope were loaded into two trucks furnished by Theodore Roosevelt National Park and Wind Caves National Park. The 36 remaining antelope were tagged and loaded into a Montana Fish and Game truck, to be released at Irving Flats, Polson, Montana.

Antelope trapping was again resumed on February 12 and 13. At this time 133 antelope were trapped. On the same day, 60 antelope were tagged and loaded to be released at Wigwam Creek, and St. Joseph Creek, Madison County. Thirty-three antelope were loaded the following day. Fifteen of these antelope were tagged and marked with plastic tags for the Moiese Range, and 18 antelope were tagged and loaded to be released at Spring Creek, Madison County. The remaining 30 antelope were tagged and loaded the following day for the Little Bitterroot Hills in Sanders County.

This wound up the antelope trapping operations in Yellowstone National Park, with a total catch of 258 antelope. Total loss for the trapping operation was eight antelope, five lost in trapping operations and three in transportation.

### LITTLE BITTERROOT HILLS

#### Antelope Released

Date Released	Does	Doe Fawns	Buck Fawns	Bucks	Total
February 15, 1951	8	7	5	10	30

#### Description of Area:

The point of this release lies southwest of Hotsprings in the Little Bitterroot Hills in Sanders County.

The terrain is rolling sagebrush and grass covered hills with small stands of timber near the tops, and river bottom land consisting of the Bitterroot River.

The climate is moderate with little snow. The area is used chiefly for grazing with some farming in the river and creek bottoms.

### IRVING FLATS

#### Antelope Released

Date Released	Does	Doe Fawns	Buck Fawns	Bucks	Total
January 21, 1951	15	4	10	7	36

#### Description of Area:

The site of this release lies west of Polson on Irving Flats on the east side of the Bitterroot River, Lake County. The physical features vary from river bottom land to rolling grass and sagebrush foothills.

### ST. JOSEPH'S CREEK

#### Antelope Released

Date Released	Does	Doe Fawns	Buck Fawns	Bucks	Total
February 13, 1951	11	6	1	12	30

#### Description of Area:

The site of this release lies 10 miles north of Ennis on St. Joseph's Creek in the Madison Range. The area consists of a number of small benches

extending from the Madison River to the base of the Madison Mountains.

Cover types are grassland and sage. Water points are readily available from creeks in the area.

Snow depths rarely exceed one foot and most of the winter there is little to none, with the wind keeping a large part of the area free of snow.

Native antelope have not existed here in recent years, but in the early days they were quite abundant, according to the old-time residents.

#### Conclusions:

This should be an excellent experimental plant, as they are fairly well confined to this area which will make it easy to stay in contact with this plant.

#### WIGWAM CREEK AND SPRING CREEK

##### Antelope Released

Date Released	Does	Doe fawns	Buck fawns	Bucks	Total
February 13, 1951	12	9	5	4	30
February 14, 1951	5	3	2	8	18
Total	17	12	7	12	48

#### Description of Area:

The site of this plant lies about 15 miles south of Ennis in the foothills of the Gravelly Range.

Cover types of the area are grasslands and sage, with it being broken up by creek bottoms in which are cultivated haylands.

The main use is grazing, with cattle dominant user. Irrigated hay meadows and fields are found along the Madison River and its tributaries.

Reports of old timers still here, and historical data show that there were antelope once present here. Snow conditions are moderate with winds baring most of the foothills.

#### MOIESE BISON RANGE

##### Antelope Released

Date Released	Does	Doe Fawns	Buck Fawns	Bucks	Total
February 14, 1951	7	4	4	0	15



Purpose:

These antelope were released on the Moiese National Bison Range. An antelope study was set up for the purpose of aging antelope and gaining other research data. Each antelope was tagged and marked with different colored plastic tags, so they could be recognized on the Bison Range in the course of this study.

ANTELOPE TRAPPING NEAR ROUNDUP

DATE:

March 26 - 30, 1951

PERSONNEL:

James Reed, Field Assistant

Maurice Wesen, Field Assistant

Frank Gummer, Field Assistant

James McLucas, Field Assistant

Jack Owens, Field Assistant

Cliff McBratney - Pilot

PURPOSE:

To restock two new areas, one near Medicine Lake in Sheridan County, and Tiger Butte in Cascade County.

PROCEDURE:

On March 26 the antelope crew left Helena for Roundup to start antelope trapping. Remarkable time was made in setting up the trap although the crew had had no previous experience.

RESULTS:

An attempt was made on March 28 to drive some antelope into the trap. Sixty-six head of antelope were successfully driven into the trap in this attempt. The flying time took less than two hours. The antelope had split up in two's and three's and the does were heavy with fawns. The antelope were left in the trap to rest overnight and the next day 33 were loaded for transporting to Medicine Lake and 29 for Tiger Butte.

Six antelope were lost in the operation. Four were lost because of injuries sustained during the trapping and two were lost during the transporting process.

Nineteen females and 13 males were released in very good condition at Medicine Lake Refuge in Sheridan County and 12 females and 16 males were released in good condition at Tiger Butte in Cascade County.

CONCLUSIONS:

Considerable difficulty was experienced in herding antelope this late in the year as they were in small groups, and does would drop out after running only a short distance. Antelope trapping should not run later than the first week in March, as casualties are greater after this date.

Submitted by:

James McLucas, Foreman  
Wildlife Restoration Division

STATE Montana  
PROJECT 27-D  
DATE April 15, 1951

ABSTRACT

Sun River Game Range Development

Approximately 2,500 of the Sun River elk wintered on the state game range.

Range forage was utilized properly and elk losses on the range were practically non-existent.



STATE Montana  
PROJECT 27-D  
DATE April 15, 1951

QUARTERLY PROGRESS REPORT

For

DEVELOPMENT

As Required By

FEDERAL AID IN WILDLIFE RESTORATION ACT

1. Title of Project: Sun River Game Range Development

2. Personnel: Bruce Neal, Unit Manager

Bob Neal, Assistant Unit Manager

3. Report of Progress:

Work during this quarter was devoted almost entirely to elk herding. This is a non-P.R. function and was paid from regular state game funds.

It is apparent that this activity is becoming less difficult each year as the animals are becoming accustomed to the state winter range area.

Approximately 2,500 wintered on the Sun River Game Range. There has been practically no loss to date and all seem to be in excellent condition.

Range forage is very good as a substantial portion of the grass was not used.

Submitted by:

Bob Neal, Asst. Unit Manager  
Wildlife Restoration Division





STATE Montana  
PROJECT 33-D  
DATE April 15, 1951

ABSTRACT

Blackfoot-Clearwater Game Range Development

Thin lines of feed were maintained to attract elk onto the state-owned lands.

Herding of trespass stock was necessary to force cattle and horses from the white-tailed deer range in the acquisition area.

Old buildings were removed and routine activity occupied the crew throughout the quarter.



STATE Montana  
PROJECT 33-D  
DATE April 15, 1951

QUARTERLY PROGRESS REPORT

For

DEVELOPMENT

As Required By

FEDERAL AID IN WILDLIFE RESTORATION ACT

1. Title of Project: Blackfoot-Clearwater Game Range Unit
2. Personnel: Stan Mongrain, Unit Manager  
Jack Ray, Assistant Unit Manager  
Al Mullenax, Laborer

3. Report of Progress:

A. Baiting and Herding Elk

Early in December the crew started moving elk onto winter range. At first, before the snow became too deep, saddle horses were used.

By locating a bunch of elk and staying behind them and gradually working them in the direction we wanted them to go, the elk could be pushed over the border onto state-owned land. In some cases several days were required in moving one bunch.

As more snow fell, the going became too tough to use saddle horses.

A feed line was started using hay and feed pellets. The same method was used in the winter of 1949-50. The route this year ran in a north and east direction from the Blackfoot-Clearwater Unit for seven miles. Care was taken in establishing this line so that any elk drifting from the high country would hit the feed before breaking into small groups and scattering on to the ranches.

In the first month of maintaining this line, close to 300 elk were herded onto the Blackfoot-Clearwater Range.

On the second of January the crew of two men maintaining the line

reported a surplus of feed on the line and very little elk sign. It was believed at first that all of the elk in the vicinity had followed the line through.

A supply of feed was spread along the line and a daily check made as to any use that should show up. On January 9 the regular check of the feed line showed signs of a large number of elk moving in. The upper half of the feed line was cleaned bare of hay, but the pellets were left. Leaving the pellets was the first indication of a new herd of elk moving in. Elk that are acquainted with the pellets prefer them to other types of feed we have tried.

In a few days the elk were eating the pellets and even looking for them. They would dig them out of the snow, following the line its full length.

The feed line was shortened a quarter of a mile at a time, gradually drawing the elk closer to the Blackfoot-Clearwater boundary.

A county road had to be crossed before the elk were where they could drift onto the winter range. Numerous attempts to draw the elk across this road proved unsuccessful. The only apparent reason for this seemed to be that the elk were on strange range. The activity along this road scared them back.

The elk were held as close in this area as was possible. It is hoped they will return next fall and can be moved onto the state range.

#### B. Removing Trespass Stock

Horses turned out to rustle their winter food drift onto the Blackfoot-Clearwater Range. They not only pick all the available feed, but the pawing through the snow to the grass roots causes the grass to freeze out leaving a permanent scar on the range.

Keeping these horses off the range requires a great deal of time. A drift fence is the only solution to this problem.

#### C. Building Removal

Buildings at headquarters that were beyond repair and of no use to the Department were removed. Material of any use was salvaged and stored. The rest of the buildings were piled and burned.

The result will be a more attractive and cleaner headquarters.

#### D. Snow Plowing

A caterpillar tractor with a dozer was rented by the Department to keep the roads open for the winter. Without snow plow equipment, winter projects cannot be carried on.

#### E. Hay and Grain Distribution

Hay raised at the Blackfoot-Clearwater Unit was hauled to various



points in the State. This hay was used for baiting traps and wintering Department-owned stock. Some grain was taken for waterfowl feeding.

A detailed report on the distribution will be presented at a later date.

Submitted by:

Stan Mongrain, Unit Manager  
Wildlife Restoration Division





